sartorius
mechatronics

Complete Catalog
Laboratory Mechatronics

turning science into solutions

Your Worldwide Partner

Sartorius is a leading international laboratory and process technology provider for the biotech, pharmaceutical and food industries. We help our customers all over the globe to implement complex and quality-critical laboratory and production processes in a time- and cost-efficient way. Our innovative products, solutions and services therefore focus on key value-creating segments in our target markets. Strongly rooted in the scientific and research communities and closely allied with customers and technology partners, we are dedicated to our philosophy of "turning science into solutions" on a daily basis.

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# Weighing Technology for Laboratories

Cubis®. The New Benchmark

Cubis is the first completely modular laboratory balance series. It is freely configurable and adaptable to different fields of application. Every Cubis is an uncompromising implementation of an individual requirement profile. The Cubis meets our stringent criteria for advanced pharma compliance and is ideally suited to quality management systems in the regulated areas of the pharmaceutical industry.

The modular Cubis system consists of display units and service units, weighing modules and draft shields.
Interface modules and a complete range of accessories permit further individual adaptations. Cubis – the most sophisticated way to concentrate on what's necessary.
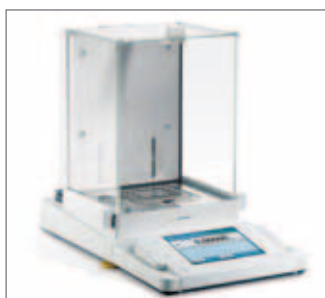
The operating concept Q-Guide – reference for fast and trouble-free navigation

Tasks and individual work processes can be set up in a quick and trouble-free way with the new operating concept Q-Guide. Thus the software and user interface of the Cubis always present the user with only that part of the complete set of options that this user requires to perform his application. If the user has defined a task, he is guided directly and interactively through the settings; irrelevant information is grayed out.

With a total of three service units, the Cubis meets the demand of different operating philosophies and covers the entire range of laboratory applications. From simple weighing to administration of complex work processes using defined tasks and user | password management.

MSE – weighing pure and simple
Large, high-contrast LCD display, easily understood menu guide with short descriptions, and clearly arranged, precisely actuated keys.

MSU – Classic and universal
High-resolution, generously dimensioned, monochrome graphical display and precisely actuated keys with a clear action point. For users who wish to combine classical operation via keys with the broadest possible range of services.

MSA – The ultimate solution
Technology and information design of the elite class. Touchscreen with high-resolution color TFT for brilliant reproduction of text and graphics. Outstanding ease of use and display quality, especially for complex applications requiring frequent text entry.

Technological innovations position the Cubis far ahead of the current standards in the premium segment
The quality, reliability and precision of Sartorius balances are legendary and require no detailed commentary. But the Cubis also offers: New benchmarks for measurement accuracy, response time and repeatability.

The first top-loading laboratory balance with accuracy to five decimal places
The Cubis is the first mass-produced, top-loading semimicrobalance with full resolution up to 220 g. This design results in an approx. 25% lower space requirement compared to conventional laboratory balances with the same resolution. The combination of a compact construction, 0.01 mg resolution and a weighing range up to 220 g is only possible with the Sartorius monolithic weighing system, which is a world first.

The first laboratory balance with Q-Pan off-center load compensation
The Cubis is the first laboratory balance to compensate for off-center loading of the weighing pan. Q-Pan simultaneously offers the user two advantages: A significant reduction in the off-center load error and consequently the use of larger weighing pans.

CUBIS | MODULAR DESIGN
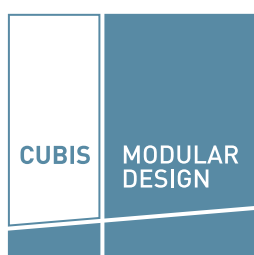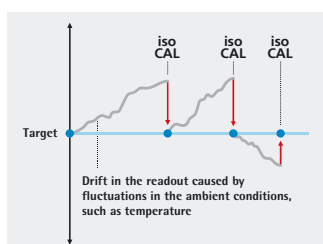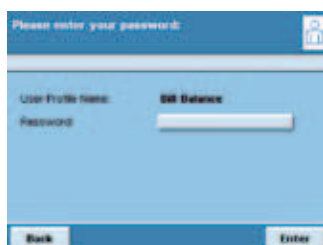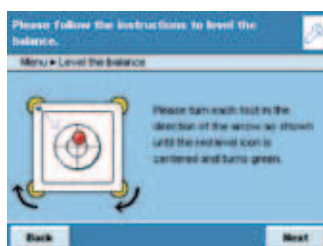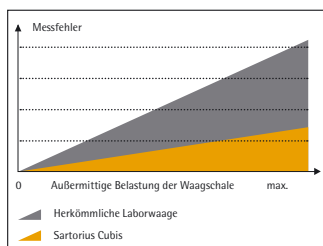
The first balance with automatic Q-Level leveling

Q-Level combines a newly developed sensor system with the latest display technology, thus making leveling of the scale easier, faster and more reliable.

Q-Level optionally permits automatic self-actuated leveling at the touch of a button or interactively guided leveling. The display provides all the necessary information: The position of the air bubble and the indication of which leveling foot should be turned in which direction (standard in the display and service units MSA and MSU; MSE with warning message only).

Cubis. The first top-loading analytical balance with a motorized draft shield

Even in draft shields, the Cubis is the new benchmark in the premium class: Smooth-running draft shield doors often offer inadequate stability; however, higher stability often makes disassembly more difficult and leads to restricted visibility. Not so with the Cubis. Despite their high mechanical stability, the draft shields of the Cubis run very smoothly thanks to their new materials. They permit excellent visibility of the entire weighing chamber and the sample and offer secure shielding against external impact factors.

Sartorius is the first manufacturer to combine the maximum ease of use of a motorized draft shield with the minimum space requirement of Cubis analytical balances and semimicrobalances.

Fast and easy working with learning capability and control via ergonomic palm-operable keys mean that the motorized DA draft shield can be adjusted to any work process. In addition to the motorized drive, the DI draft shield possesses an integrated ionizer which, at the touch of a button, eliminates the impact of electrostatic charges on samples or sample vessels.

For cleaning purposes, all doors of the draft shield can be disassembled in just a few steps.

Advanced pharma compliance. For the use of the Cubis in regulated areas

Both inspection equipment monitoring as a component of QM systems and the United States Pharmacopeia set very stringent requirements for supervisors and laboratory devices. The advanced pharma compliance of the Cubis offers more than the best possible prerequisites for compliance with general regulations. Advanced pharma compliance permits the seamless integration of the Cubis into processes and thus provides valuable support in implementing individually designed safety concepts, e.g. with

– easy, fast and thorough cleaning.
  Only high-grade materials with smooth, structure-free surfaces are used.

– Protection against manipulation with user | password management.

– Audit trail function – logs major changes to the device. In this way, errors can be tracked quickly.

– Integrated Alibi memory for traceable transfer to a PC of weighing data subject to calibration requirements.

– Maximum connectivity with Q-Com. Three fixed (USB, RS232C, Ethernet (not on the MSE)) and three optional interfaces make almost all forms of bidirectional communication possible.

– GLP-compliant, configurable printout.

– All data, such as the user's master data or tasks, can be transferred easily and safely from one Cubis to another using an SD card (not on the MSE).

– Fully automatic calibration | adjustment with isoCAL.

– Warning and reminder functions with configurable action hierarchy for leveling, minimum initial weights, calibration | adjustment.

Please use the adjacent fields to enter the selection made with the icon.

Cubis display and service units
Select the display and service unit and enter it in the field marked with the icon.

Types	MSA	MSU	MSE
Operation	Touchscreen, keys for central basic functions	Keys	Keys
Display	High-resolution color TFT, 5.7" graphical display	High-resolution black-and-white, 5.7" graphical display	Black-and-white LCD display,
Adaptation of the service unit	Tiltable display, removable service unit	Tiltable display, removable service unit	removable service unit
Standard data interfaces	– USB (integrated into weighing module) – RS232C accessory interface, 25-pin (integrated into weighing module) – Ethernet (integrated into display and service unit)	– USB (integrated into weighing module) – RS232C accessory interface, 25-pin (integrated into weighing module) – Ethernet (integrated into display and service unit)	– USB (integrated into weighing module) – RS232C accessory interface, 25-pin (integrated into weighing module)
SD card reader	Integrated as standard into display and service unit	Integrated as standard into display and service unit	
Operation of the motorized draft shield (only for DA or DI draft shields)	Actuation via side keys or contactlessly via IR switch (optional), learning capability	Actuation via side keys or contactlessly via IR switch (optional), learning capability	Actuation via keys or contactlessly via IR switch (optional), learning capability
Applications	Unit conversion, SQmin function for minimum initial weight according to USP, isoCAL automatic calibration | adjustment function, individual identifiers, density determination, statistics, calculations, averaging, formulation, weighing in percent, time-controlled functions, totalizing, DKD measurement uncertainty, second tare memory, counting, checkweighing	Unit conversion, SQmin function for minimum initial weight according to USP, isoCAL automatic calibration | adjustment function, individual identifiers, density determination, statistics, calculations, averaging, formulation, weighing in percent, time-controlled functions, totalizing, DKD measurement uncertainty, second tare memory, counting, checkweighing	Unit conversion, SQmin function for minimum initial weight according to USP, isoCAL automatic calibration | adjustment function, density determination (buoyancy method only), calculations, averaging, net | total formulation, weighing in percent, counting

Cubis leveling
Select the type of leveling and enter the identifier "Ø" or "1" in the field marked by the icon.

Ø	The Cubis shows the level indicator on the display and provides support for rapid leveling (as standard on the display and service units MSA and MSU; only a warning message in MSE).
1	Fully automatic, motorized Q-Level leveling at the touch of a button (available for all analytical balances and semimicrobalances with 0.1 mg or 0.01 mg readability and all precision balances with 1 mg readability).

Test certificates and permits
Select a test certificate \| permit and enter the identifier in the field marked with the icon.

ØØ	Standard certificate of conformity to specifications
TR	Like ØØ, but with a detailed test protocol
CE	Calibrated in the factory with European calibration permit

Optional interface modules
Depending on the balance, it may be possible to select an additional interface module.

IR	RS232 interface, 25-pin
IB	*Bluetooth*® interface
IP	RS232 interface, 9-pin, inc. PS|2 interface

Cubis weighing modules

Enter the module identifier from the left, starting with the field marked with the icon.

	Readability [mg]	Weighing capacity [g]	Weighing pan (BxD) [mm]	Typical stabilization time [s]	Typical response time [s]	Repeatability [mg]	Linearity [mg]	Off-center load [mg]* (test load [g])	Minimum initial weight [g]**
225S	0.01	220	85 × 85	2	6	0...60 g: 0.015 60...220 g: 0.025	0.1	0.15 (100)	0.02
225P	0.01 │ 0.02 │ 0.05	60 │ 120 │ 220	85 × 85	2	6	0...60 g: 0.015 60...220 g: 0.04	0.15	0.2 (100)	0.02
125P	0.01 │ 0.1	60 │ 120	85 × 85	2	6	0...60 g: 0.015 60...120 g: 0.06	0.15	0.15 (50)	0.02

Analytical balances
0.1 mg

	Readability [mg]	Weighing capacity [g]	Weighing pan (BxD) [mm]	Typical stabilization time [s]	Typical response time [s]	Repeatability [mg]	Linearity [mg]	Off-center load [mg]* (test load [g])	Minimum initial weight [g]**
324S	0.1	320	85 × 85	1	3	0.1	0.3	0.3 (200)	0.12
224S	0.1	220	85 × 85	1	3	0.07	0.2	0.2 (100)	0.12
324P	0.1 │ 0.2 │ 0.5	80 │ 160 │ 320	85 × 85	1	3	0.1 │ 0.2 │ 0.4	0.5	0.4 (200)	0.12
124S	0.1	120	85 × 85	1	3	0.1	0.2	0.2 (50)	0.12

Precision balances

	Readability [mg]	Weighing capacity [g]	Weighing pan (BxD) [mm]	Typical stabilization time [s]	Typical response time [s]	Repeatability [mg]	Linearity [mg]	Off-center load [mg]* (test load [g])	Minimum initial weight [g]**
3203P	1 │ 10	1,010 │ 3,200	140 × 140	1	1.5	1 │ 6	5	2 (1,000)	1.5
2203S	1	2,200	140 × 140	1	1.5	1	3	2 (1,000)	1.5
2203P	1 │ 10	1,010 │ 2,200	140 × 140	1	1.5	1 │ 6	5	3 (1,000)	1.5
1203S	1	1,200	140 × 140	1	1.5	0.7	2	2 (500)	1.5
623S	1	620	140 × 140	0.8	1	0.7	2	2 (200)	1.5
623P	1 │ 2 │ 5	150 │ 300 │ 620	140 × 140	0.8	1	1 │ 2 │ 4	5	4 (200)	1.5
323S	1	320	140 × 140	0.8	1	0.7	2	2 (200)	1.5
10202S	10	10,200	206 × 206	1	1.5	7	20	20 (5,000)	12
8202S	10	8,200	206 × 206	1	1.5	7	20	20 (5,000)	12
6202S	10	6,200	206 × 206	1	1.5	7	20	20 (2,000)	12
6202P	10 │ 20 │ 50	1,500 │ 3,000 │ 6,200	206 × 206	1	1.5	7 │ 20 │ 40	50	50 (2,000)	12
4202S	10	4,200	206 × 206	0.8	1	7	20	30 (2,000)	12
2202S	10	2,200	206 × 206	0.8	1	7	20	20 (1,000)	12
1202S	10	1,200	206 × 206	0.8	1	7	20	20 (500)	12
12201S	100	12,200	206 × 206	0.8	1	50	100	200 (5,000)	100
8201S	100	8,200	206 × 206	0.8	1	50	100	200 (5,000)	100
5201S	100	5,200	206 × 206	0.8	1	50	100	200 (2,000)	100

* Position according to OIML R76   ** typical minimum initial weight according to USP (United States Pharmacopeia), USP31–NF26

Cubis draft shields

Select a draft shield and enter the corresponding identifier in the field marked with the icon.

DO	No draft shield. Please always enter this identifier for weighing modules with the weighing pan size 206 × 206 mm.
DE	Manual glass draft shield for precision balances with a readability of 1 mg.
DU	Manual analytical balance draft shield with smooth-running, wide-opening doors, unimpeded access to the weighing chamber without interfering braces. For all models with 0.01 mg, 0.1 mg and 1 mg readability.
DA	Automatic, motorized draft shield with learning capability for ergonomic working and individual adaptation to different applications. For all models with 0.01 mg, 0.1 mg and 1 mg readability.
DI	Like the DA draft shield, but with the addition of an integrated ionizer to eliminate the impact of electrostatic charges in samples and vessels.

Premium Ultramicrobalances and Microbalances SE2, ME5 and ME36S. Highest Precision – Even for the Smallest Sample Quantities

Design 1

Design 2

Design 3

The premium microbalances meet the most stringent requirements when it's necessary to achieve measurement results quickly and with exceptional accuracy
The balances also offer maximum support when used as testing equipment in the context of a QM system. This is ensured by performance features such as the

– SQmin function: Display of the permitted minimum initial weight according to the United States Pharmacopeia (can be activated by Sartorius Service)

– Fully automatic calibration and adjustment function (isoCAL)

– ISO|GLP-compliant logging

– Input of alphanumeric sample identifiers

100% glass draft shield
The motorized draft shield on the SE2 and ME5 is made entirely of glass with no frame to obstruct your view. A special coating on the glass inside the chamber eliminates interfering factors – such as those caused by electrostatically charged objects.

Cleaning as easy as 1–2–3
In just one easy step, you can completely remove the draft shield. The weighing chamber base plate features smooth, easy-to-clean surfaces. Such design features really pay for themselves whenever absolute cleanliness is the number one priority.

Easy to operate
The generously sized opening of the draft shield moves to any desired position – you can choose to operate the draft shield by pressing a palm-operable key, a foot switch (optional) or an external computer.

Fast results
With stabilization times of only 10 seconds, the SE2 and ME5 will save you valuable time during each weighing operation.

Brilliant readability
The backlit, high-contrast graphical display ensures excellent readability. Text-based user guidance allows the balance to be configured quickly and confidently "if you need to do more than just weighing".

Flexible
Every ultramicrobalance and microbalance has 14 built-in application programs as standard features, such as air buoyancy correction, differential weighing program, and statistical evaluation.

Featuring a readability of 1 µg, the ME36S offers an exceptionally wide weighing range up to a capacity of 31 g and outstanding metrological specifications, making it ideal for highly accurate microweighing and for weighing microquantities into heavy tare containers.

All balance-generated data can be logged via the standard RS232Cdata interface.

Filter weighing
The models ME5-F and SE2-F were specially designed for weighing filters of up to 90 mm in diameter. The draft shield is made completely of metal, thereby minimizing the interfering effects of static electricity.

Specifications

Model		SE2***	ME5***	ME36S***	SE2–F Filter balance	ME5–F Filter balance
Weighing capacity	g	2.1	5.1	31	2.1	5.1
Readability	µg	0.1	1	1	0.1	1
Repeatability (±)	µg	0.25	1	2	0.25*	1**
Linearity (≤ ±)	µg	0.9	4	10	0.9*	4**
Response time (average)	s	10	10	14–18	10*	10**
Weighing pan ∅	mm	20	30	30	50 or 20 (75 and 90 optional)	50 or 30 (75 and 90 optional)
Design		1	1	3	2	2

*   with standard weighing pan ∅ 20 mm
**   with standard weighing pan ∅ 30 mm
*** Models SE2, ME5 and ME36S are available in calibrated versions

Premium Semimicrobalances and Analytical Balances: Sartorius ME – When Results Matter

Unrivaled speed
An outstanding feature of the Sartorius ME series is speed: stable readouts with five decimal places in just eight seconds.

Controlled by palm-operable keys or by custom programming, the draft shield closes quietly, precisely and quickly. It can be adapted to any weighing scenario, according to the requirements of your application.

Unrivaled stability
Repeatability of the weights measured is an additional strength of the Sartorius ME. The results are just as stable as the monolithic weighing system of the ME.

The Sartorius ME is amazingly impervious to the surrounding environment of its installation location. Interfering static electricity on samples and tare containers can be neutralized at the touch of a button.

Unrivaled reliability
Sartorius ME stands for reliability, year in, year out. That's why we are offering a three-year warranty, which we will extend on request up to a total of five years.

The Facts
Unique monolithic weighing system

Three-part, motorized draft shield system

User-friendly palm-activated keys for draft shield operation; foot switch optional for applications where you need your hands free

Neutralization of static electricity

Prompts in clear English for operator guidance

Alphanumeric input capability for sample IDs

Software support for use in quality management systems

SQmin function displays the minimum initial weight in accordance with the United States Pharmacopeia (can be activated by Sartorius Service)

Display of measurement uncertainty according to the German Calibration Service (DKD)

ISO|GLP-compliant, user-configurable records|printouts

Built-in applications
Built-in software supports all key laboratory weighing applications to ensure smooth, time-saving lab procedures and reliable results.

– Density determination

– Calculation of weights using a definable factor or equation

– Statistical evaluation

– Differential weighing

– Air buoyancy correction

– Air density determination

Specifications

Model	ME235S	ME235P	ME235P-SD*	ME614S	ME414S	ME254S
Weighing capacity (g)	230	60|110|230	60|110|230	610	410	250
Readability (mg)	0.01	0.01|0.02|0.05	0.01|0.02|0.05	0.1	0.1	0.1
Repeatability (≤mg)	0.015 (0–60 g) 0.025 (60–230 g)	0.015 (0–60 g) 0.040 (60–110 g) 0.040 (110–230 g)	0.015 (0–60 g) 0.040 (60–110 g) 0.040 (110–230 g)	0.1	0.1	0.07
Linearity (≤ ± mg)	0.1	0.15	0.15	0.4	0.3	0.15
Response time (≤s)	8	8	8	3	2.5	2.5
Off-center load at ½ maximum load (≤mg) (according to OIML R76)	0.15	0.2	0.2	0.6	0.4	0.3
Weighing pan diameter (mm)	90	90	90	90	90	90
Clearance above weighing pan (mm)	253	253	195	253	253	253

All models are available in verified versions (excluding *)
* with short-design draft shield and pipette opening, ⌀ 60 mm, with cover

Standard Micro-, Semimicro-, Analytical and Precision Balances
The New Sartorius CPA: Unrivalled in Its Performance Class
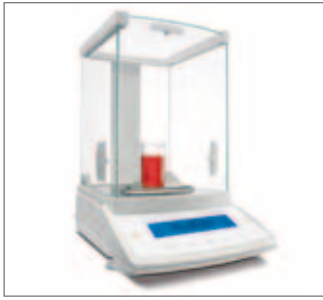
As the successor to the Sartorius Competence series, which proves its reliability on a daily basis in practical use, the Sartorius CPA also sets standards for engineering, quality and features. If you want to avoid taking risks when you make the investment in a new balance, the new CPA is the best choice you can make.

Whether your samples are in the microgram range or up to 34 kg, the Sartorius CPA series with its 29 models offers the right instrument for practically every weighing task in the laboratory.

Engineering
All balances in the Sartorius CPA series are equipped with a monolithic weighing system available only from Sartorius. This system is not only incredibly precise, but also exceptionally reliable and durable.

And the new Sartorius CPA scores winning points with further technical advantages that ensure continuous operation of the balance with the greatest possible accuracy:

Take the built-in, motorized adjustment weight: Just touch the CAL key, and the balance will automatically perform internal calibration and adjustment – whenever required in your process.
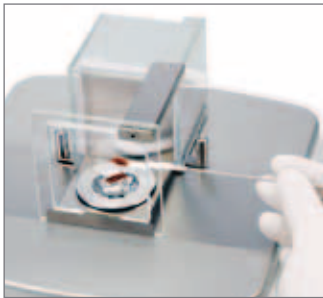
And there's the isoCAL function. When the ambient temperature changes by a specific value or once a defined time interval has elapsed, isoCAL performs internal calibration and adjustment fully automatically. Therefore, the balance ensures that calibration is carried out at regular intervals, and delivers consistently high accuracy.

On top of this, the high-contrast, backlit display is exceptionally easy to read under any room lighting conditions (non-backlit micro- and semi-microbalances available).

Quality
Not just the housing, but also the entire construction of the new Sartorius CPA with its powerful core, the monolithic weighing system, stand up to the abuse of tough daily use. The same goes for the control keys, the components on a balance that are most frequently used. Even after they have been pressed tens of thousands of times, they will continue to work precisely, just like they did from day one, with positive click action for reliable activation of their respective functions.

Features
The Sartorius CPA has precisely the features you need for fast and professional processing of weighing tasks in everyday laboratory routines. This includes ISO|GLP-compliant documentation. Connected to a Sartorius YDP20-0CE data printer or a computer, the new Sartorius CPA enables you to comply with documentation requirements for use in a quality management system.

The draft shield designs of the balance models featuring readabilities of 1 µg, 2 µg, 0.01 mg, 0.1 mg or 1 mg are also impressive. Both the construction and size are specially adapted to the particular readability, offering tangible assets in actual use:
– Excellent shielding from drafts
– Draft shield doors that glide open smoothly for optimal access to the weighing chamber
– Outstandingly easy-to-clean design.

A bidirectional RS232C data interface provides the ideal basis for communication, for example with a PC.

For advanced applications, such as weighing in percent, net-total formulation, dynamic weighing or animal weighing, mass unit conversion and counting, the CPA offers easy-to-run programs as standard features.
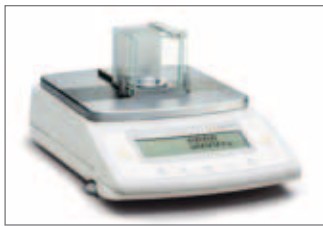
Design 1

Design 2

Design 3

Design 4

Design 5

Specifications

Model	Read–ability (mg)	Weighing capacity (g)	Repeat–ability (≤ ± mg)	Linearity (≤ ± mg)	Response time (average) (≤ s)	Weighing pan (mm)	Design
Microbalances							
CPA2P	0.001 | 0.002 | 0.005	0.5 | 1 | 2	0.001 | 0.002 | 0.003	0.002 | 0.004 | 0.005	10	∅ 20	1
CPA26P	0.002 | 0.01	5 | 21	0.004	0.008	10	∅ 50	3
CPA2P-F Filter balance	0.001 | 0.002 | 0.005	0.5 | 1 | 2	0.002 | 0.003 | 0.004	0.002 | 0.004 | 0.005	10	∅ 20 ∅ 125 Filter weighing pan	2
Semimicrobalance							
CPA225D	0.01 0.01 | 0.1	40 | 100 | 220	0.02 | 0.05 | 0.1	0.03 | 0.1 | 0.2	6 | 3	∅ 80*	4
Analytical balances							
CPA324S	0.1	320	0.2	0.3	3	∅ 80*	5
CPA224S	0.1	220	0.1	0.2	2	∅ 80*	5
CPA124S	0.1	120	0.1	0.2	2	∅ 80*	5
CPA64	0.1	64	0.1	0.2	2	∅ 80*	5

* Triangular weighing pan shape.   ∅ = Diameter of the inner circle.

Design 6

Design 7

Design 8

Design 9

Design 10

Specifications

Model	Read–ability (g)	Weighing capacity (g)	Repeat–ability (≤ ± g)	Linearity (≤ ± g)	Response time (average) (≤ s)	Weighing pan (mm)	Design
Precision balances							
CPA1003S**	0.001	1,000	0.001	0.002	2	⌀ 110*	6
CPA623S	0.001	620	0.001	0.002	1.5	⌀ 110*	7
CPA1003P**	0.001 | 0.01	500 | 1,000	0.001 | 0.01	0.002 | 0.02	2	⌀ 110*	6
CPA423S	0.001	420	0.001	0.002	1.5	⌀ 110*	7
CPA323S	0.001	320	0.001	0.002	1.5	⌀ 110*	7
CPA223S	0.001	220	0.001	0.002	1.5	⌀ 110*	7
CPA6202S	0.01	6,200	0.01	0.02	1.5	190×204	8
CPA5202S-DS**	0.01	5,200	0.01	0.02	1.5	⌀ 130	9
CPA4202S	0.01	4,200	0.01	0.02	1.5	190×204	8
CPA3202S	0.01	3,200	0.01	0.02	1.5	190×204	8
CPA2202S	0.01	2,200	0.01	0.02	1.5	190×204	8
CPA2202S-DS**	0.01	2,200	0.01	0.02	1.5	⌀ 130	9
CPA6202P	0.01 | 0.02 | 0.05	1,500 | 3,000 | 6,200	0.01 | 0.01 | 0.03	0.02 | 0.02 | 0.05	1.5	190×204	8
CPA34001S	0.1	34,000	0.1	0.2	2	400×300	10
CPA16001S	0.1	16,000	0.1	0.2	2	400×300	10
CPA12001S	0.1	12,000	0.1	0.2	2	400×300	10
CPA10001	0.1	10,000	0.1	0.2	1	190×204	8
CPA8201	0.1	8,200	0.1	0.2	1	190×204	8
CPA34001P	0.1 | 0.2 | 0.5	8,000 | 16,000 | 34,000	0.1 | 0.2 | 0.5	0.3 | 0.3 | 0.3	2	400×300	10
CPA5201	0.1	5,200	0.1	0.2	1	190×204	8
CPA34000	1	34,000	0.5	1	1.5	400×300	10

* Triangular weighing pan shape.   ⌀ = Diameter of the inner circle.   ** = Equipped with the analytical balance draft shield as a standard feature.   All models are available in calibrated versions (excluding CPA2P, CPA2P-F, CPA2202S-DS, CPA5202S-DS, CPA1003P). Accessories available on request.

Standard Analytical and Precision Balances Extend
The New Achievers for Your Lab

On paper, many lab balances look the same. But in the real world, there's more to a lab balance than just its technical specifications.

The new Sartorius Extend series was specially designed for effective and reliable weighing in daily lab routines. This is where more powerful technology and application-oriented operation and features make all the difference.

Winning technology
More versatility in high-resolution applications: 1 mg to 620 g and 10 mg to 6200 g. High-end technology made standard.

The monolithic weighing system, only available from Sartorius worldwide, offers unique prerequisites for permanently high measurement accuracy and reliability.

The latest powerful microprocessor technology ensures shorter response times for faster results. In an Extend balance with 1 mg readability, the typical response time is just 1 to 1.2 seconds. Reliable weighing results are achieved all the time – even under less than ideal ambient conditions, thanks to the Extend's highly sophisticated digital compensation algorithms.

Ease of use
When you need to get a heavy workload of repetitive applications done fast and reliably, day in and day out, the last thing you need is a lab balance so complicated that it causes operating errors and wastes your valuable time as a result. This is not the case with the Sartorius Extend. A simple, easy-to-understand control panel, key function assignments and the easy-to-read display are ideal for efficient weighing in your lab.

User-friendly operation: short, plain-English text prompts and cursor keys for navigation make it simple for you to configure the balance to meet your individual requirements.

The backlit display with its 15-mm digits means the results of measurement are plain to see, under any lighting conditions.

The level indicator is positioned conveniently right next to the display – so that checking whether the balance is level becomes "second nature" to the operator.
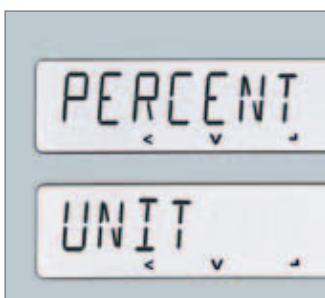
The range of features
Add up all features of the new Sartorius Extend, and you'll find all the advantages that only a genuine Sartorius lab balance can offer: features that pay for themselves, time and again.

A built-in, motorized calibration weight is standard in all analytical balances. Applied at a touch of a button, it ensures the highest weighing accuracy. The precision balances, depending on requirements, are available in two versions – with internal calibration (-CW) or external calibration.

Whenever you need ISO|GLP-compliant documentation of raw data or calibration| adjustment data, the Sartorius Extend balance provides it at the touch of a key (in combination with the optional YDP20-0CE data printer).

The easy-to-clean draft shield chamber on the analytical balances provides optimal lighting conditions inside, thanks to its nearly frameless all-glass design.

The following additional built-in application programs come as standard:

Weighing in percent, net-total-formulation, calculation (multiplication|division), dynamic weighing|animal weighing, mass unit conversion, and counting

The bidirectional RS232C data interface is another standard feature. Alternatively, Sartorius can provide an adapter cable for connection to a USB port.

Design 1

Design 2

Design 3

Design 4

Specifications

Model	Read-ability (mg)	Weighing capacity (g)	Repeat-ability (mg)	Linearity (≤ ± mg)	Response time (average in s)	Weighing pan (mm)	Design
Analytical balances							
ED224S	0.1	220	0.1	0.2	2.5	∅ 90	1
ED124S	0.1	120	0.1	0.2	2.5	∅ 90	1

Model	Read-ability (g)	Weighing capacity (g)	Repeat-ability (g)	Linearity (≤ ± mg)	Response time (average in s)	Weighing pan (mm)	Design
Precision balances							
ED623S-CW	0.001	620	0.001	0.002	1	∅ 115	2
ED623S*	0.001	620	0.001	0.002	1	∅ 115	2
ED423S-CW	0.001	420	0.001	0.002	1	∅ 115	2
ED423S*	0.001	420	0.001	0.002	1	∅ 115	2
ED323S-CW	0.001	320	0.001	0.002	1	∅ 115	2
ED323S*	0.001	320	0.001	0.002	1	∅ 115	2
ED153-CW	0.001	150	0.001	0.002	1.3	∅ 115	2
ED153*	0.001	150	0.001	0.002	1.3	∅ 115	2
ED6202S-CW	0.01	6,200	0.01	0.02	1.1	180×180	4
ED6202S*	0.01	6,200	0.01	0.02	1.1	180×180	4
ED4202S-CW	0.01	4,200	0.01	0.02	1.1	180×180	4
ED4202S*	0.01	4,200	0.01	0.02	1.1	180×180	4
ED3202S-CW	0.01	3,200	0.01	0.02	1.1	180×180	4
ED3202S*	0.01	3,200	0.01	0.02	1.1	180×180	4
ED2202S-CW	0.01	2,200	0.01	0.02	1.1	180×180	4
ED2202S*	0.01	2,200	0.01	0.02	1.1	180×180	4
ED822-CW**	0.01	820	0.01	0.02	1	∅ 150	3
ED822*	0.01	820	0.01	0.02	1	∅ 150	3
ED8201-CW	0.1	8,200	0.1	0.1	1	180×180	4
ED8201*	0.1	8,200	0.1	0.1	1	180×180	4
ED5201-CW	0.1	5,200	0.1	0.1	1	180×180	4
ED5201*	0.1	5,200	0.1	0.1	1	180×180	4
ED2201-CW	0.1	2,200	0.1	0.1	1	180×180	4
ED2201*	0.1	2,200	0.1	0.1	1	180×180	4

All models, except those marked with *, are devices available in calibrated versions.

** Weighing pan size for calibrated versions: 180 × 180 mm.

Budget–Class Analytical and Precision Balances Talent
The Affordable Introduction to Sartorius Weighing Technology

Sartorius Talent series balances are the alternative for all your simple weighing operations: economically priced yet with an uncompromisingly high degree of quality, reliability and sophisticated weighing technology. Whether you need to operate a balance in the lab, at school or a university, or in the field using the battery function, a balance from the Sartorius Talent series will always be the number one choice.

19 models – one design
The right weighing capacity for every application and every budget? No problem with the Talent series. It offers you 3 analytical balances with weighing capacities of 60 g, 120 g and 210 g, respectively, and a total of 16 precision balances – ranging from the top-of-the-line model with a 3,100-g weighing capacity and 0.01-g readability to the high-capacity model featuring a 12-kg capacity.

Ease of use
When it comes to strictly weighing, ease of use is the top priority. The balances in the new series prove to be particularly talented in this area: Just set it up, switch it on, and start weighing. It couldn't be any easier.

Dependable and accurate
Permanent reliability and weighing certainty are ensured by the innovative weighing system technology, and the robust construction of the balance housing.

Portability is standard
Many of the Talent series balances are also battery-operable, providing an alternative to line current operation. The built-in "power-saver" feature extends the service life of the battery. This function will automatically shut off the balance if a key has not been pressed after 2 minutes. An added benefit of this portable application: the balance is compact and lightweight.

Built-in application software
Talent series balances offer various application programs as standard features to make routine work easy: weighing in percent, net-total formulation, weigh averaging| dynamic weighing, counting and mass unit conversion.

RS232C data interface
Each model comes standard with a bidi-rectional RS232C data interface. This means no extra cost if you need to log the balance-generated results on an optional printer or connect a remote display for use in the educational sector.

Design 1

Design 2

Design 3

Design 4

Specifications

Model	Read–ability (mg)	Weighing capacity (g)	Repeat–ability (≤ ± g)	Linearity (≤ ± g)	Response time (average) (s)	Weighing pan (mm)	Design
Analytical balances							
TE214S	0.1	210	0.0001	0.0002	3	∅ 90	1
TE124S	0.1	120	0.0001	0.0002	3	∅ 90	1
TE64	0.1	60	0.0001	0.0002	3	∅ 90	1

Model	Read–ability (g)	Weighing capacity (g)	Repeat–ability (≤ ± g)	Linearity (≤ ± g)	Response time (average) (s)	Weighing pan (mm)	Design
Precision balances							
TE313S	0.001	310	0.001	0.002	2.5	∅ 100	2
TE313S-DS*	0.001	310	0.001	0.002	2.5	∅ 100	1
TE153S	0.001	150	0.0015	0.003	2.5	∅ 100	2
TE153S-DS*	0.001	150	0.0015	0.003	2.5	∅ 100	1
TE3102S	0.01	3,100	0.01	0.02	2.5	174 × 143	4
TE1502S	0.01	1,500	0.015	0.03	2.5	174 × 143	4
TE612	0.01	610	0.01	0.02	2	∅ 116	3
TE412	0.01	410	0.01	0.02	2	∅ 116	3
TE212	0.01	210	0.01	0.02	2	∅ 116	3
TE6101	0.1	6,100	0.1	0.2	2	174 × 143	4
TE4101	0.1	4,100	0.1	0.2	2	174 × 143	4
TE2101	0.1	2,100	0.1	0.2	1.5	174 × 143	4
TE601	0.1	610	0.1	0.2	1.5	174 × 143	4
TE12000	1	12,000	1	2	1.5	174 × 143	4
TE6100	1	6,100	1	2	1.5	174 × 143	4
TE4100	1	4,100	1	2	1.5	174 × 143	4

* with analytical balance draft shield

Accessories

Accessories for Cubis models

Calibratable data printer for connection to RS232, 25-pin Accessory interface	YDP10-0CE
Calibratable data printer with *Bluetooth®* data transfer (only in connection with YDO01MS-B or option IB)	YDP10BT-0CE
Paper rolls for printer YDP10-0CE; 5 x 40 m rolls	6906937
Color ribbon for YDP10-0CE and YDP10BT-0CE	6906918
Additional display, LCD, figure size 13 mm, backlit	YRD03Z
RS232C connection cable, to connect to PC with 9-pin COM interface, length 2 m	7357314
Standard operating procedure (SOP)	YSL07D
Infrared sensor for contactless function triggering (e.g. draft shield control)	YHS01MS
Hand switch for printing, taring or using a function key; Selection via menu, inc. T-connector	YHS02
Foot switch for printing, taring or using a function key; Selection via menu, inc. T-connector	YFS01
Foot switch for the functions open|close draft shield (only in combination with DA and DI draft shield), taring and printing	YPE01RC
Density determination kit for solids and liquids for weighing modules with a readability < 1 mg	YDK01MS
Density determination kit for solids and liquids for weighing modules with a readability 1 mg	YDK02MS
3–segment control display, red – green – red, for plus|minus weighings, inc. T-connector	YRD11Z
Barcode reader with connection cable, 120 mm reading range	YBR03PS2
Pipette calibration kit for models with 0.01 mg and 0.1 mg readability; hardware and software	YCP04MS
Software for pipette calibration	on request
RS232C data interface 25-pin for connection of Cubis accessories	YDO01MS-R
Data interface® for wireless connection of data printer YDP10BT	YDO01MS-B
RS232C data interface, 9-pin including PS|2 for connecting a PC or a keyboard	YDO01MS-P
Antistatic weighing pan, diameter 130 mm, for weighing modules with a readability of 0.1 mg or 0.01 mg	YWP01MS
Support arm for 10|100 mg precision weighing modules for raising the service units MSE, MSU, MSA	YDH01MS
Weighing table made from synthetic stone, with vibration dampening	YWT03
Wall console	YWT04
Weighing table from wood with synthetic stone for precise, reliable measurements	YWT09
Service unit with backlit LCD display and tactile keys	YAC01MSE
Service unit with backlit b|w graphic display and tactile navigation keys	YAC01MSU
Service unit with color TFT graphic display and touchscreen	YAC01MSA
Display cable 3 m for Cubis models, or separated setup of display and weighing unit	VF4016
SartoCollect software for data communication between balance and PC	YSC02
Sartorius OPC server for integration of all Sartorius Cubis balances (requires 32-bit Microsoft Windows 2000 or XP with current service packs). (free download of a 30-day trial version from the Sartorius website) – Initial license – Each additional license within an order	6289OPC 6289OPC-

Accessories for all ME, SE, CPA, ED and TE models

Data printer, calibratable, with date, time, statistics	YDP20-0CE
Paper rolls for printer YDP20-0CE; 5 x 40 m rolls	6906937
Color ribbon for YDP20-0CE	6906918
Adhesive labels on normal paper for YDP20-0CE (20 m continuous roll)	69Y03247
SartoCollect, data transfer and integration on computer	4SC02
Weighing table for precise, reliable weighings	YWT09
Weighing table made from synthetic stone, with vibration dampening	YWT03
Wall console	YWT04
Additional display LCD, figure size 13 mm, reflective	YRD02Z
Hand switch, inc. T-connector	YHS02
Foot switch, inc. T-connector	YFS01
Ionization blower for electrostatically charged samples [220 V]	YIB01-0DR
Ionization blower for electrostatically charged samples [110 V]	YIB01-0UR
Ionization probe Stat–Pen for discharging electrostatically charged samples	YSTP01
T–connector for connection of 2 peripheral devices	YTC01
RS232C│USB connection cable, for connection to a PC via USB interface; length 1.5 m	YCC01-USBM2
RS232C connection cable, for connection to a PC with 25-pin COM interface; length approx. 2 m	7357312
RS232C connection cable, for connection to a PC with 9-pin COM interface; length approx. 2 m	7357314
Standard operating procedure (SOP)	YSL01D
LCD, figure size 13 mm, reflective	YRD03Z
3-segment control display, red – green – red, for plus│minus weighings, inc. T-connector	YRD11Z

Accessories for ME models and SE2

Battery set, external with optical charge control display for SE2, ME5 and all ME models	YRB05Z
Antistatic weighing pan for electrostatically charged samples for ME235S, ME235P, ME254S, ME414S, ME415S and ME614S for ME5	YWP01ME YWP01MC
Density determination kit for ME235S, ME235P, ME254S, ME414S, ME415S and ME614S	YDK01
Storage plate, for acclimatization of materials to be weighed, for all ME models (excluding ME5)	YGS01ME
Weighing scoop made from chrome nickel steel, 90 mm × 32 mm × 8 mm	641214
Foot switch, inc. T-connector for all ME models and SE2	YPE01RC
Barcode reader, for all ME models and SE2 (YCC01-0024M01 required)	YBR02FC
Cable with T–connector, for connection of the barcode reader	YCC01-0024M01
Bluetooth® **RS232C adapter** with external antenna (only point-to-point connections)*	YBT01
Bluetooth® **USB adapter** (point-to-multipoint capability)*	YBT02

* The operation of these devices is only permitted in the following countries: Austria, Belgium, Denmark, Finland, France (indoor use only), Germany, Greece, Iceland, Ireland, Liechtenstein, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.
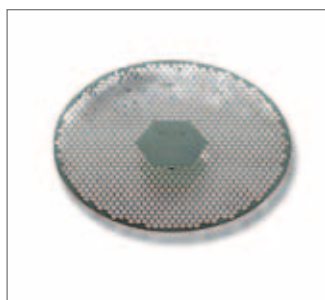
Accessories for CPA and ED models

Battery set, external, with optical charge control display	
up to 10 kg weighing capacity	YRB05Z
from 12 kg to 34 kg weighing capacity	YRB06Z
Analytical balance attachment	YDS01CP
for CPA623S, CPA423, CPA323S, CPA223S	
Antistatic weighing pan	YWP01CP
for CPA225D, CPA324S, CPA224 S, CPA124S, CPA64, ED224S, ED124	
Density determination kit	
for CPA225D, CPA324S, CPA224S, CPA124S	YDK01
for ED224S, ED124S	YDK01LP
Draft shield cover with hole ($\varnothing$ 30 mm)	YDS02CP
for CPA623S, CPA423S, CPA323S, CPA223S	
Hook for under-scale weighing, screwable, for CPA12001S, CPA16001S, CPA34001S, CPA34001P, CPA34000	69EA0040
Bluetooth®**-RS232C adapter** with external antenna (only point-to-point connections)*	YBT01
Bluetooth®**-USB adapter** (point-to-multipoint capability)*	YBT02
In-use dust cover	
for display and control unit CPA34001S, CPA16001S, CPA12001S, CPA34001P, CPA34000	6960CP01
for CPA423S, CPA323S, CPA623S, CPA223S	6960CP02
for CPA4202S, CPA3202S, CPA2202S, CPA8201, CPA6202S, CPA6202P, CPA5201, CPA10001	6960CP03
for display and control unit CPA225D, CPA324S, CPA224S, CPA124S, CPA64	6960CP04

Accessories for TE models

Battery set, external (service life: 20 or 40 hours, depending on model)	YRB08Z

* The operation of these devices is only permitted in the following countries: Austria, Belgium, Denmark, Finland, France (indoor use only), Germany, Greece, Iceland, Ireland, Liechtenstein, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

Safety Weighing Cabinet SWC
Safe Weighing of Toxic and Powdery Substances

For researchers and laboratory technicians, working with poisonous or highly reactive substances does pose a considerable risk. Especially when weighing, the smallest sample amounts have a high risk potential.

Health and safety are top priorities
In order to protect the health of laboratory personnel, proper safety measures must be taken when weighing dangerous powdered substances.

The Sartorius Safety Weighing Cabinet SWC offers many significant design advantages over a regular laboratory hood: It creates a contained area around the laboratory balance which prevents any air or finely powdered particulates from escaping into the operating personnel's work area. At the same time, the constant inlet air velocity and the special cabinet construction both keep the air current practically turbulence-free, and, as a result, ensure consistent and repeatable weighing results.

Single-source equipment
The balance and weighing cabinet are perfectly matched to each other. With its SWC Safety Weighing Cabinet, Sartorius has succeeded in uniting two otherwise contradictory requirements: maximum personnel protection and reliable weighing results.

The Safety Weighing Cabinets are available in four different sizes for special applications, such as using a second laboratory balance in the cabinet or for unusually high structures.

Each of the four basic models consists of: Safety Weighing Cabinet with a separate HEPA filter unit, data-logging alarm, lighting unit, waste disposal system (on one side), airflow smoke test kit and anti-static cleaning wipes.

Sartorius SWC Safety Weighing Cabinets comply with the requirements of EN14175.

| Model with filter unit	Model without filter unit	Dimensions in mm (Width × Depth × Height)
SWC900	SWC900NF	890×750×510
SWC1200	SWC1200NF	1230×750×510
SWC900T	SWC900TNF	890×750×770
SWC1200T	SWC1200TNF	1230×750×770

Accessories

YWCF02	Carbon filter for solvent vapors
YWCF03	Box for carbon filter; for attachment to the filter box
YWCG01	Disposal chute for attachment to the side of the cabinet
YWCG02	Disposable chute bags (100 pcs)
YWCG03	Muffler for attachment to fan filter box
YWCG04	Airflow smoke test kit
YWCG07	Antistatic decontamination wipes
YWCG16	Printer table for attachment to the cabinet
YWT10	Laboratory bench; fits SWC900, SWC900T and SWC900NF
YWT11	Laboratory bench; fits SWC1200, SWC1200T and SWC1200NF

Other accessories for our Safety Weighing Cabinets are available on request.

All of the balances listed below have been tested for use in the Safety Weighing Cabinet and achieved their typical repeatability with correspondingly extended response times.

Balance series	Cubis	ME	Sartorius CPA	Extend ED
Microbalances		ME5 ME36S	CPA2P	
Semimicrobalances	all Cubis models with 0,01 mg readability and draft shield DU, DA or DI	ME235S ME235P	CPA225D	
Analytical balances	all Cubis models with 0,1 mg readability and draft shield DU, DA or DI	ME614S ME414S ME254S	CPA324S CPA224S CPA124S CPA64	ED224S ED124S
Precision balances	all Cubis models with 1 mg readability and draft shield DE, DU, DA or DI		CPA1003S CPA1003P CPA623S CPA423S CPA323S CPA223S CPA2202S-DS CPA5202S-DS	ED623S ED423S ED323S ED153 All models listed are also available in –CW versions

Sartorius Density Determination
The Optimal Equipment for All Methods
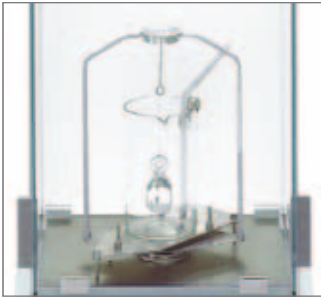
Whether you use the buoyancy method, the displacement principle or the pycnometer method for determining the density of solid, powdery or liquid samples – Sartorius offers you the technical equipment for performing these applications simply, quickly and precisely.

These include:
– Analytical and precision balances
– The YDK01 or YDK01LP density determination kits
– An integrated application program built into the balance for density determination (standard software in all ME and LA balances)

Easy to use
Nothing is more annoying in laboratory applications than complicated operating sequences with delicate and sensitive instruments. This is why our density determination kits have been built to be especially rugged and uncomplicated.

Perfected technology and practical accessories
Large and easily accessible sample holders are supplied so that you can perform measurements in air or in a buoyancy medium. The special design prevents air bubbles from adhering, which could otherwise distort your results.

If you weigh a substance with a density less than that of the buoyancy medium – forget the extra work. The specially shaped weighing pan lets you immerse your sample effortlessly below the surface of the liquid.

And determination of the density of liquids couldn't be easier than with our standardized glass plummet.

The integrated application software controls the measurements and evaluates them for you
The application software integrated into the balances of the ME and Cubis series provides you with the ultimate in user convenience.

Just select your preferred method of measurement by menu, weigh your samples and the balance does the entire evaluation for you. In the process, it automatically takes into account all important factors that influence the measurement. For example, after you have entered the temperature, the balance directly calculates the density of the selected immersion medium.

Results in black and white
A record of your results is printed out on the interfaced data printer – if you wish, as an ISO|GLP-compliant record.

The printout includes the following data:

– Temperature and density of the buoyancy medium

– Weight value of the sample during weighings in air and immersed in the medium

– The volume and the density of the sample

Which density kit for which balance?
YDK01 density set for:

– ME models with 0.01 mg and 0.1 mg readability

– CPA324S, CPA224S, CPA124S, CPA225D

YDK01LP density set for:

– ED models with 0.1 mg readability

YDK01MS density set for:

– Cubis models with < 1 mg readability

Bluetooth® Wireless Technology*
Weigh and Communicate Wirelessly

Bluetooth® wireless technology, widely used for laptops and mobile telephones, offers real advantages for both measurement and data storage processes. With a range of up to 100 meters, wireless connection of measuring stations, PCs and peripheral devices is now completely feasible for laboratory use.

No more cables to trip over, no more cable ducts and dust collectors, no more inconvenient restrictions when positioning devices because infrared data interfaces have to be connected to one another within line of sight. Not only for mobile weighing, but also for clean-room and ultraclean-room conditions or contaminated environments, *Bluetooth*® wireless technology represents a practical alternative that eliminates connection problems before they occur.

Another major advantage of *Bluetooth*® wireless technology is the ability to connect multiple weighing stations in individual networks.

The installation is extremely simple. This technology uses the 2.45 GHz ISM band (for industrial, scientific, and medical usage). No fees are charged for this frequency, which means no added recurring costs for the user.

Data security is a high priority in *Bluetooth*® wireless technology. The data transfer in both send and receive directions is protected by the use of frequency hopping, and other encryption techniques are also available. Thus, even sensitive areas are reliably secured.

With the YBT01 module for connection to the RS232C data interface on the balance, and the YBT02 module for connection to the computer's USB port, Sartorius presents a solution that meets the most sophisticated requirements, with the same high quality as our premium balances designed for use in the chemical and pharmaceutical industries.

The communication module has a stainless-steel housing that meets the highest cleanliness requirements optimally. All data transfer procedures and protocols are familiar to anyone who has used RS232C data interfaces.

So you can say goodbye to cable problems. All thanks to *Bluetooth*® wireless technology. The modules are suitable to use with any of our premium-series ME and Cubis balances.

The equipment may be used only in the following countries: Austria, Belgium, Denmark, Finland, France (indoor use only), Germany, Greece, Iceland, Ireland, Liechtenstein, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

YBT01
Bluetooth® RS232C adapter with external antenna. Point-to-point connections only.

Transmitting power	Complies with Class 1
Supported profiles	Serial port
Data transfer rate	1,200...115,200 bits/s (can be configured by Sartorius service)
Temperature range	0... +40 °C
IP protection class	IP65
Dimensions (L × B × H)	121 mm × 84 mm × 32 mm (without antenna, cable, wall bracket)

YBT02 Bluetooth® USB adapter. Point-to-multipoint capability.

Transmitting power	Complies with Class 1
Specifications	*Bluetooth*® wireless technology V.1.1
PC software	*Bluetooth*® device driver
Operating system	Windows® 98, 2000, XP

* The brand name and logo for *Bluetooth*® wireless technology are owned by Bluetooth SIG Inc., USA.
  The use of this trademark by Sartorius is under license.

Eliminate Static Electricity Quickly and Reliably

Static electricity can block the entire work-flow of everyday lab routines. When samples are weighed, particularly non-conductive sample materials such as plastic, glass or porcelain, an electrostatic field may build up between the sample and the stationary parts of the balance. As a rule, this effect is seen when the digits of a weight readout seem to "race out of control." This makes reliable weighing, particularly in the analytical field, very difficult. By ionization of samples using the Sartorius StatFan or StatPen ionizing blower, static electricity is neutralized within just a few seconds, making it unnecessary to increase the humidity of the air. Elimination of static electricity can be performed instantly wherever needed, without any time delay.

Sartorius ionizing blowers can be used anywhere undesirable electrostatic charges are generated; for example, in production areas and photographic labs. The flow rate of the ionizing stream can be continuously adjusted. For StatPen, the flow rate is altered by moving it closer or further away from a sample.

Specifications

	Power connection	AC adapter	Neutralization	Airflow	Weight
Ionizing blower StatFan YIB01-0DR	230 V|50 Hz	18 V|50 Hz	Up to ± 20 V	Up to 1,000 ccm/min	approx. 0.6 kg
Ionizing blower StatFan YIB01-0UR	110 V|50 Hz	18 V|50 Hz	Up to ± 20 V	Up to 1,000 ccm/min	approx. 0.6 kg
StatPen YSTP01	100 V…230 V 50…60 Hz		Up to ± 30 V		approx. 0.8 kg

Sartorius Pipette Calibration
Totally Accurate, Efficient and Independent

GPC65-CW

GPC26-CW|GPC225-CW

YDB01WZA

Save time and money

Pipettes are gauges used as inspection, measuring and test equipment. GLP guidelines and ISO standards require pipettes to be tested at defined intervals to ensure their continued proper functioning. Quick testing must also be performed between these intervals. Having pipette calibration performed externally can be expensive and time-consuming. Backup pipettes must also be available to maintain routine operations. The equipment for performing the oft-required quick tests is not even available in many cases.

Now you can calibrate your pipettes yourself quickly and inexpensively with the GPC Pipette Calibration Balance or YCP03-1 Pipette Calibration Kit from Sartorius.

Procedure

The liquid taken up in the pipette is weighed on a balance. The volume of the liquid is calculated from its weight and density and compared with the nominal volume for the pipette. The balance transmits the weight value to the PC where all the required calculations are performed – for example, by the Picaso software. At the end of each measurement, the calibration results are printed as a GLP-compliant report. The installation of an evaporation trap maintains the humidity at 60–90 %, thus preventing loss of liquid from the pipetting vessel.

GPC Pipette Calibration Balances

Fast and user-friendly

The balances in the GPC series are ideally suited for gravimetric testing of the volume of any pipette size.
Because these balances do not require an additional draft shield, opening and closing of the draft shield doors is eliminated. This saves considerable time.
The calibration workstation's modular design can be optimally adapted to your lab staff's ergonomic needs.

"On the go" pipette calibration

With the optional YDB01WZA carrying case, you can pack up your GPC pipette calibration balance along with the other accessories.
Ambient conditions permitting, you have everything you need to calibrate your pipettes directly at the place of use.

Equipment supplied

– Weighing cell with separate electronics box

– Display|service unit with 1 m cable
  (GPC65-CW: 0.3 m cable)

– Motorized calibration and adjustment function with built-in calibration weight

– Bidirectional RS232 data interface port

– Leveling feet and level indicator

– AC adapter

– Pipette calibration kit consisting of:

– Evaporation trap

– Pipetting vessels 6 ml and 21 ml
  (3 of each)

– Special adapter and reduction fittings for pipetting vessels

– Cable for connecting the balance (RS232) to a PC (USB)

Overview of GPC models

Model capacity	Readability	Weighing capacity	Pipetting weighing
GPC26-CW	0.001 mg	20 g	0.001 mg – 8 g
GPC65-CW	0.01 mg	60 g	0.01 mg – 35 g
GPC225-CW	0.01 mg	220 g	0.01 mg – 195 g

Optional accessories	Order number
PICASO pipette calibration software (PC running Windows operating system 98|2000|NT or XP required)	YCP03-2
Draft shield and 50 ml stainless-steel vessel (for GPC65-CW and GPC225-CW only)	YDS01WZA
Carrying case for mobile use	YDB01WZA

PICASO pipette calibration software

ME235P-SD

ME5 with VF988

Pipette calibration kit YCP03-1

Optimize your pipette calibration

With the YCP03-1 Pipette Calibration Kit, you can save time, money, and organizational effort. Of course, you need to choose the best balance for your needs to benefit from all these advantages.

If you need a balance for other uses as well ...

... the Sartorius microbalances and semimicrobalances are the right solution for you. You can turn your balance into a pipette calibration workstation – and then back into an ordinary balance again – quickly and easily.
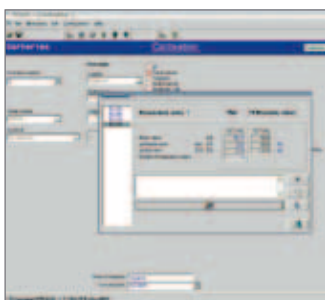
Equipment supplied

– Picaso program CD

– Evaporation trap

– Weighing system adapter

– Vessel adapter for 21 ml vessels

– Reduction fitting for 6 ml pipetting vessel

– Pipetting vessels 6 ml and 21ml (3 of each)

– Connection cable for balance – computer

– Centering disk for the evaporation trap

– Carrying case

Picaso system requirements

Picaso requires a PC running Windows® 95|98|NT|2000|XP with an RS232C interface port for the interface cable, 64 MB RAM and at least 20 MB available hard disk space.

Overview of Picaso software performance features

– Measurement data saved at a click of the mouse

– Program includes presaved specifications of more than 450 pipette types

– Measurements in accordance with British Standard, ASTM and EN ISO 8655

– Individual pipettes inventoried

– Data records are GLP-compliant and include mean, (in)accuracy, (im)precision, and standard deviation

– Statistics displayed in graphs

– Time-controlled functions for monitoring calibration cycles

– Online help for all functions

Overview of balance models

Model*	Readability (mg)	Weighing capacity (g)
ME36S (VF3677 required)	0.001	31 (16 g**)
ME5 (VF988 required)	0.001	5
CPA26P (VF3604 required)	0.002|0.01	5|21
ME235S	0.01	230
CPA225D (VF2396 required)	0.01|0.1	100|220
ME235P	0.01|0.02|0.05	60|110|230
ME235P-SD (with short-design draft shield)	0.01|0.02|0.05	60|110|230

Accessories	Order number
Pipette calibration kit incl. PICASO pipette calibration software (for all of the above-named balance models, except ME5)	YCP03-1
Short-design draft shield and adaptation of YCP03-1 for CPA225D	VF2396
Adaptation of YCP03-1 for ME36S	VF3677
Adaptation of YCP03-1 for CPA26P	VF3604
Special pipette calibration kit for ME5 consisting of: Draft shield, evaporation trap, vessel adapter and pipetting vessel (2.5 ml)	VF988

* Models ME235S, ME235P, CPA225D, ME5 and ME36S are also available in versions calibrated for legal metrology.
** Weighing capacity with pipette calibration kit installed: 16 g

OEM Products

Do you need a weighing sensor for your applications?
Sartorius offers excellent and precise sensors for mass determination. Whether you need to count small parts or batch precise amounts of liquids and solids, we have the right sensors for your solution.

In addition to monitoring and filling, our weighing cells are used in a variety of application areas, from tensiometers and thermogravimetric systems to checkweighers and special balances, to name but a few.

The table below shows the range of OEM products available, with details on weighing capacities and readabilities. The possibilities go beyond what you see here – in close cooperation with you, we can also develop customer-specific solutions adapted to individual requirements.

Contact us and we'll advise you on all the possibilities.

Weighing capacity (g)	Readability (mg)	Individual components without CE mark	Encapsulated components with CE mark		Explosion-protected		Optional built-in calibration weight
			IP20	IP44	IP44	IP65	
0.5 … 2	0.001…0.005		WZ2P-CW				
20	0.001		WZA26-CW				
60	0.01		WZA65-CW				
60	0.1	WZ64S					
60	0.1	WZ64-CW					
60	0.1			WZA64			…-CW
60	0.1				WZA64-X		
120	0.1	WZ124S					
120	0.1	WZ124-CW					
120	0.1			WZA124			…-CW
180	0.1			WZA224-ND			
210 | 80	0.01 | 0.1	WZ215-CW					
210	0.1	WZ214S					
220	0.01		WZA225-CW				
220	0.1	WZ224-CW					
220	0.1			WZA224			…-CW
600	0.1		WZ614-CW				
320	1	WZ323		WZA323			…-CW
520	1	WZ523		WZA523			…-CW
620	1				WZA623-X		
1,000	10					WZG1	
1,200	1	WZ1203		WZA1203			…-CW
2,000	20					WZG2	
6,200	10				WZA6202-X		
8,200	10	WZ8202		WZA8202			…-CW
10,000	100					WZG10	
12,000	100	WZ12001		WZA12001	WZA12001-X		
20,000	200			WZA224-ND		WZG20	

Examples of order number combinations

WZ523	Weighing cell with individual components without built-in calibration weight
WZ523-CW	Weighing cell with individual components with built-in calibration weight
WZA523	Weighing cell with encapsulated components without built-in calibration weight

For more information on our weighing systems, visit our website:
http://www.sartorius.com/index.php?id=1215

Moisture and Water Content Measurement

The Right Equipment for Any Application

Foods, chemical|pharmaceutical products, building materials or animal feed – you name it, the moisture or water content has a decisive impact on price, processability and quality, ranging from raw materials to final products. Determining this moisture content is one of the most common analyses in product development and in the manufacturing process. Here, the most diverse requirements on speed, resolution of the values measured or on the operating design of the moisture analyzers must also be considered in all cases. As a leading provider of moisture analysis equipment, Sartorius is thoroughly familiar with the needs of its customers and thus offers a wide range of equipment that is continuously being enhanced.

Infrared drying – fast and precise

A fast alternative to the classic oven drying method, infrared dryers from the Sartorius series of **Moisture Analyzers** are being increasingly used. These analyzers are compact and designed for routine operation in production and in applications involving incoming inspection. They feature the resolution of an analytical balance, and are ideal for research and development. Moreover, these moisture analyzers are supplied in versions with an EC type-approval certificate for use in legal metrology. Sartorius offers a custom solution for nearly every requirement. A wide selection of infrared heat sources, such as a halogen lamp, a CQR quartz glass heater and a ceramic heating element, enable these moisture analyzers to be optimally adapted to the intended application.

Microwave drying

If the sample contains a large amount of water, microwave drying is the fastest and most effective sample heating method. It takes just 40–120 seconds to vaporize the water out of the sample. If under normal pressure conditions, the temperature of the escaping water vapor measures slightly over 100°C during the heating process. As such, this method is comparable to the 105°C setting in a classic oven dryer.

Differential weighing

If the oven drying method is absolutely essential, the differential weighing program of the **LA Reference** series of balances efficiently manages large volumes of data and automatically calculates the differences between the tare weight, initial sample weight and backweight.

Coulometry – selective detection of water

If you need to determine not the moisture, but the water content of a sample, the coulometric Karl Fisher titration method is the most commonly used technique. A further advancement in KF filtration is the combination method incorporated in the **Water Detection System WDS 400**. The WDS 400 allows accurate measurements to be performed down to a detection threshold of 1μg of water. At the same time, it enables quantitative differentiation among surface water, capillary water, and water of crystallization. In addition, the WDS 400 completely eliminates the need for the test reagents required in KF titration.

Microwave Resonance Technology

The microwave resonance method offers the advantage of particularly fast measurement, well below one second. At the same time, it is non-destructive, which means that this versatile method can be used in the laboratory and for online and offline applications.

The basis of this new Sartorius product line is the LMA300P, a modular system that consists of a control and evaluation unit and a resonator module in which the moisture of a sample is measured. Applications for the system cover measurement of the moisture in pourable, granulated and viscous products with a moisture content between 0.1–60%.

The new PMD300 series can analyze moisture levels online, meaning that the analysis is performed and the results passed to the processing unit continuously. Highly sensitive sensors integrated in the production line constantly analyze moisture content and send the information to the processing unit, which is directly connected to the controller, ensuring that the entire process is constantly controlled and documented – and 100% automatic.

NIR Technology

Optical or spectroscopic methods exploit the interaction between light and the sample. If light is directed onto a sample, part of that light is reflected, changing it characteristically. The resulting change in the light is then used to calculate the moisture content. NIR spectroscopy is a nondestructive technology, meaning that the samples can be used for further analyses. In addition, NIR spectroscopy is fast, reliable and precise.

The LMA500 NIR calibrator is the first in our new NIR spectroscopy series. It not only analyzes moisture content, it can also do on-site calibration, allowing adaptation of methods to the materials being tested at a given time. The NIR calibrator is designed for pourable and granulated substances with a moisture content between 0.1% and 50%, depending on the sample.

Sartorius MA35
Easy ... Very Easy!

The MA35 is the new basic model in the moisture analyzer series from Sartorius. Its performance functions and operating concept are geared toward daily routine processes such as repetitive QC monitoring of samples as performed during in-process control and incoming goods inspection. To make the MA35 even more user-friendly, we have done away with seldom-used programming options without compromising flexibility or measurement accuracy.

No need for programming
End-point determination is fully automatic. It is no longer necessary to program a shutoff parameter. The MA35 continuously monitors the drying process and stops the measurement as soon as the sample has reached a constant weight – i.e., when no more weight loss can be detected despite heating. A built-in weighing system provides the measurement accuracy required for this with 1-mg resolution that is optimized for use in high temperature ranges. For sample heating, the MA35 is equipped with two powerful metal tubular-shaped heating elements, providing 360 watts of power. These heating elements, also called dark radiators, are both rugged and durable. Compared to heating lamps made from glass, e.g. infrared lamps or halogen heaters, these are especially resistant to dirt and vibration. In addition, the MA35's metal heating elements can be used in accordance with the strict guidelines of the FDA and HACCP in cases where glass is prohibited in certain production processes.

Easy-to-understand and error-free moisture analysis
The operating design focuses on accuracy and ease of use. The concise display shows the user all important information at a single glance. Easy-to-understand icons guide you in three steps from taring the sample pan to starting the measurement. The MA35 has done away with the regular Program Selection menu, opting instead for a limited number of drying routines that can be saved in the non-volatile memory. All important operating parameters can be accessed and changed in seconds, giving you more flexibility.

The optional printer, YDP20-0CE, enables you to print analysis results on a short report to save on paper usage. If you need comprehensive documentation, you can also print out the sample analysis results as well as the weighing system and temperature calibration as a detailed GLP report.

Sartorius MA150. The Compact Class With Maximum Performance and Minimum Space Requirements
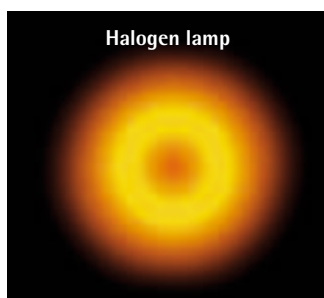
Halogen lamp
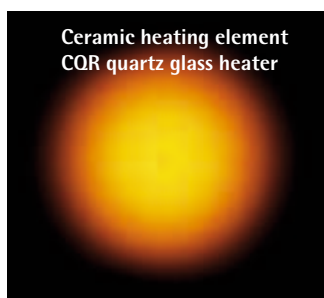
Ceramic heating element
CQR quartz glass heater

For routine operation

A rugged design with low space requirements and easy operation are the major features of the MA150. Fully automatic drying of a sample until a constant weight is reached eliminates the need for programming an endpoint shutoff parameter. Twenty drying routines can be saved to give you the flexibility you need when the moisture content of additional, "out-of-the-ordinary" samples of material has to be measured.

Customizable and fast

Sartorius offers you a choice of two different moisture analyzers that cover diverse requirements on moisture measurements. Whichever heat source you opt for, both analyzers deliver results within just minutes. For temperature- sensitive samples, a ceramic heating element ensures especially gentle heating over the entire surface. The other choice, a CQR quartzglass heater, optimizes the analysis time even further, which is already ultra-fast for the analyzer featuring the ceramic heater.

Application-specific solutions

Practical accessories round off the entire line-up of Sartorius moisture analyzers. These include, for instance, an in-use dust cover that is included with the standard equipment supplied and a special version of the moisture analyzer without openly accessible glass components in compliance with the stringent FDA and HACCP requirements that ban the use of glass in production.

Sartorius MA100. Analytical Precision, Combined with Flexibility and Dynamics

As accurate as an analytical balance
The **MA100** is the first infrared dryer in the world that features a built-in weighing system with 0.1-mg resolution and an EC type-approval certificate. A motorized heating unit moves over the sample to open or close the sample chamber. This reduces interfering effects when a sample is placed on the pan or a measurement is started. The pacesetting design enables the MA100 to achieve a measuring accuracy well beyond that provided by conventional infrared dryers.

Automatic adaptation to reference values
The acronym "SPRM" stands for "Swift Parameter Adjustment to a given Reference Method." This function enables the operating parameters of **MA100** to be adapted to the results of an available reference method and to be saved as a drying routine. Optimization of operating parameters doesn't get any faster than this.

Flexible and modular
The Sartorius MA100 analyzers give you a choice of three different infrared heat sources: a halogen lamp for standard applications, a ceramic heating element for gentle heating of temperature-sensitive samples and a CQR quartz glass heater. The CQR combines the fast drying capability of a halogen lamp with the gentle heating capability of a ceramic heater for drying samples evenly over their entire surface. A printer that can be optionally integrated into the housing eliminates the tangle of cables so typical of an external printer, and helps tidy up your work area.

A clean solution
Did you accidentally spill a sample? Are there spatters of grease inside the sample chamber? No problem with the MA 100. The Plug & Dry® feature enables you to easily slide out the cover with the heater for thorough cleaning, without the risk of cleaning agent entering the inside of the housing.

Specifications
MA35 │ MA100 │ MA150

	MA35	MA100	MA150
Max. weighing capacity (g)	35	100	150
Accuracy of the weighing system (mg)	1	0.1	1
Weighing system with EC type-approval certificate		•	
Repeatability, average (%)			
– for initial sample weight approx. >1 g	± 0.2	± 0.1	± 0.2
– for initial sample weight approx. >5 g	± 0.05	± 0.02	± 0.05
Readability (%)	0.01	0.001	0.01
Display mode for results			
– % moisture	•	•	•
– % dry weight	•	•	•
– % RATIO	•	•	•
– g residue	•	•	•
– g/kg residue		•	•
– g/l residue			•
– mg weight loss		•	•
– Calculated value (measured value × factor)		•	
Temperature range and settings			
– 40°C–160°C, adjustable in 1-degree increments	•		
– 30°C–230°C, adjustable in 1-degree increments		•	
– 40°C–220°C, adjustable in 1-degree increments			•
Heating mode			
– Standard drying	•	•	•
– Quick drying		•	
– Gentle drying		•	•
– Phase drying		3×0.1–999 min.	
Analysis mode			
– Fully automatic	•	•	•
– Semi-automatic		1–50 mg/5–300 sec. 0.1–5.0%/5–300 sec.	1–50 mg/5–300 sec. 0.1–5.0%/5–300 sec.
– Timer settings	1×0.1–99 min.	3×0.1–999 min.	1×0.1–99 min.
– Timer mode × fully│semi-automatic		2×0.1–999 min. + automatic	
SPRM® mode for parameter recognition		•	
Heating unit			
– Ceramic IR heating element (infrared)		•	•
– Halogen lamp (infrared)		•	
– CQR heater (coiled quartz radiator)		•	•
– Metal tubular-shaped heating element (infrared dark radiator)			
Later exchange of the heating unit by Plug & Dry®*		•	
Access to the sample chamber			
– via hinged, flip-up cover	•		•
– via motorized cover		•	

	MA35	MA100	MA150
Optional version compliant with FDA|HACCP regulations**	●		●
DLG Signam approved			●
Built-in calibration weight		●	
Operator guidance features			
– Context-sensitive menu with alphanumeric interactive prompts and symbols (icons)	●	●	●
– Text input for sample identification using soft-key prompts		●	
– Numeric keypad for sample identification and parameter input		●	
– Parameter input using soft-key prompts	●	●	●
reproTEST for determining the repeatability of the weighing system		●	
Number of program memories	1	30	20
Memory for data storage			
– Statistics of the last 9,999 measurements		●	
– End point up to the next moisture analysis run	●	●	●
Parameter settings password-protected against unauthorized access		●	●
Manual input of tare weights		●	
Data printer			
– Integratable (optionally retrofittable)		●	
– External (optional)	●	●	●
Printout			
– GLP-compliant, user-configurable		●	●
– GLP-compliant, inalterable standard configuration template	●		
– Short record	●		
Data interface port			
– RS-232C unidirectional	●		●
– RS-232C bidirectional		●	
Bar code scanner can be connected		●	
In-use dust cover for keypad		●	●
Power consumption (VA)	max. 400	max. 700	max. 700
Housing dimensions (mm) W×D×H	224×366×191	350×453×156	213×320×180.5
Weight. approx. (kg)	5.8	8.0	5.5

*   Does not apply to the CQR heater
** Not available with halogen lamp or CQR quartz glass heater

Accessories
MA35 | MA100 | MA150

Accessories	MA35	MA100	MA150
Disposable sample pans, 80 units, Aluminum, round, ⌀ 90 mm	6965542	6965542	6965542
Glass fiber filters, ⌀ 90 mm for analysis of liquid, pasty and fatty samples – Hard quality, for viscous samples, 80 units – Soft quality with high suction force, 200 units	 6906940 6906941	 6906940 6906941	 6906940 6906941
Panel replacement set Aluminum panels for replacing glass panels to meet FDA|HACCP regulations (conversion kit)	YDS05MA	YDS03MA	YDS04MA
SartoCollect, Software for communication between moisture analyzer and PC (including 25 Pin|9 Pin, 2 m) cable	•	•	•
Carrying case			YDB05MA
Data printer – Integratable – External	 YDP20-0CE	 YDP01MA YDP20-0CE	 YDP20-0CE
Ink ribbon cartridge for data printer	6906918	6906918	6906918
Paper rolls for data printer, – 5 rolls, 50 m each	 6906937	 6906937	 6906937
External calibration weight – 100 g (E2) DKD Certificate – 30 g ± 0.3 mg DKD Certificate – 50 g (E2) DKD Certificate	 YSS43-00	 YCW4528-00	 YCW5128-00
Temperature adjustment set with manufacturer's certificate	YTM01MA	YTM03MA	YTM03MA
500 disposable pipettes	YAT01MA	YAT01MA	YAT01MA

Are you interested in receiving more information
about our moisture analyzers?
At www.sartorius.com you will find our applications
database packed with information on which
analyzer is best for which application and which
Sartorius operating parameters are recommended.
Moreover, numerous scientific articles are available
for download as PDF files.

Sartorius LMA200PM
Speed Meets Analytical Precision

If the sample contains a high moisture content, microwave drying is the fastest and most effective thermogravimetric method (loss-on-drying principle) for moisture analysis. Developed for measuring moisture content ranging from approx. 8% to 100%, the LMA200PM performs moisture analysis in a fraction of the time it takes for other thermogravimetric methods. It delivers results between approx. 40–120 seconds on average. With a cylindrical design, a focused emission of microwave energy is channeled vertically through dual apertures at the bottom of the chamber. This concentrates the microwave energy specifically to the sample. During the test, a carousel spins the sample, permitting an even distribution of microwave energy. This prevents hot and cold spots from occurring, a familiar problem with conventional microwave analyzers.

Built-in analytical balance
The moist and dry weight of the sample required for calculating the loss of moisture is measured by a built-in analytical weighing system featuring 0.1 mg resolution. Thanks to its monolithic design (the cell is robotically etched from a single block), this system is particularly suitable for use in a moisture analyzer, because it considerably reduces zero point drift during heat exposure when compared with classic weighing systems.

Intelligent endpoint determination
A moisture sensor integrated in the exhaust system of the sample chamber monitors the progress of drying. When the measurement begins, the moisture of the air inside the sample chamber continuously increases as water evaporates from the sample. Once the sample has dried and no longer releases water, the air moisture content drops back to its original level – a clear indication of the end point. At the same time, the built-in weighing system monitors the weight progression and confirms when the sample reaches a constant weight. This dual monitoring system ensures optimal moisture analysis results.

High speed
Two factors play a major role for ultra-fast measurements. First, the sample must absorb microwave energy within the shortest time possible and transform it into heat energy. For this purpose, the LMA200PM has a cylindrically shaped sample chamber that focuses the microwave radiation on the sample optimally. Second, the resulting water vapor must be transported away from the sample as fast as possible to obtain rapid analysis results. To accomplish this, a sample is applied to a glass fiber pad that allows water vapor to evaporate not only from the top of the pad and upward through the sample, but also from the bottom of the pad. An exhaust system draws water vapor out of the sample chamber, thus preventing the effects of condensation.

Specifications|Accessories
LMA200PM

Model	LMA200PM
Weighing capacity (g)	70
Measuring accuracy of the weighing system (g)	0.0001
Reproducibility on average Initial sample weight starting at approx. 1 g (%)	± 0.05
Sample carriers	90 mm $\varnothing$ (3½") glass fiber pads
Display modes	% moisture, ppm moisture, % volatile components, % dry weight (solids), ppm dry weight, g dry weight, mg loss on drying, % RATIO
Measuring range	Approx. 8–100% moisture
Sample heating	– Microwave generator with 1000 W input power
Power control for heating	– 2–100%, adjustable in 1% increments

Endpoint determination	– Fully automatic, by means of weight and moisture sensors
	– User-defined as loss of weight|time:
	  1–50 mg/ 1–99 sec.
	  0.1–9.9 %/ 1–99 sec.
	– Timer mode: 0.1–99.9 min.

Analysis time (in seconds)	Approx. 40–120 (depends on sample and moisture)
Programs	320, saved to non-volatile memory
Data printer	Thermal printer, built-in
Moisture analysis report	– User-configured GLP record – The report can be printed on non-fading paper by the built-in thermal printer.
Operator guidance	– Menu-driven, alphanumeric dialogue text (English, French, German, Italian and Spanish selectable) – 5 pre-programmed function keys
Data interfaces	– 1 × RS-232 port for PC – 1 × Ethernet port
Housing dimensions W x D x H (mm) | (in)	510 × 535 × 304 | 20 × 21 × 12
Weight, approx. (kg) | (lbs)	22 | 48.5
Power consumption (VA)	1200 max.

Accessories	Order no.
200 glass fiber pads	6906941
500 disposable pipettes	YAT01MA
5 rolls of printer paper, each with 20 m	69M30100

Sartorius WDS 400. Selective Detection of Surface Water, Capillary Water and Water of Crystallization

Water, not moisture

Thermogravimetric methods, such as the oven drying method, use the weight loss of a sample to determine the total content of all volatile components and not, however, the pure water content. As a rule, the latter task is performed using electrochemical techniques that are based on the principle of coulometry (coulomb = electric charge). The most commonly known methods are coulometric Karl Fisher titration for solid and liquid samples and the phosphorus pentoxide method for trace analysis of gases. However, both methods require complicated equipment; moreover, KF titration necessitates the use of additional chemicals in order to perform an analysis. The WDS 400 Water Detection System from Sartorius combines these three standard methods into a high-resolution and easy procedure for selective detection of water in solids and pastes.

Get all three in one

The WDS 400 adopts the principle of convection heating from the oven drying method in order to drive out the entire moisture from a sample. A ceramic disc coated with extremely hygroscopic phosphorus pentoxide P_2O_5 completely absorbs the water from the resulting gas mixture and bonds water molecules to phosphoric acid H_3PO_4 on the disc surface in a chemical reaction.

By coulometry, i.e., by an electric current generated at the ceramic disc, phosphoric acid is broken down into phosphorus pentoxide P_2O_5, hydrogen H and oxygen O. Based on Faraday's law, it is known how much current is necessary in order to split off all hydrogen atoms from a chemical compound. Thus, the WDS 400 uses the amount of electric current to calculate the quantity of water driven out of a sample.

Highly accurate and selective

This combination method works so accurately that it is even possible to detect one single microgram of water. Beyond that, the WDS 400 enables water fractions to be differentiated according to surface water, capillary water and water of crystallization (the latter is chemically bound water).

Easy operation

All the user has to do is just weigh-in a sample. The WDS 400 does not require any complicated handling of detection reagents, many of which are toxic. For measurement of the water content, the user can choose the type of carrier gas, either nitrogen (Class 5.0) or room air. For using room air, the WDS 400 has a built-in pump and a drying unit.
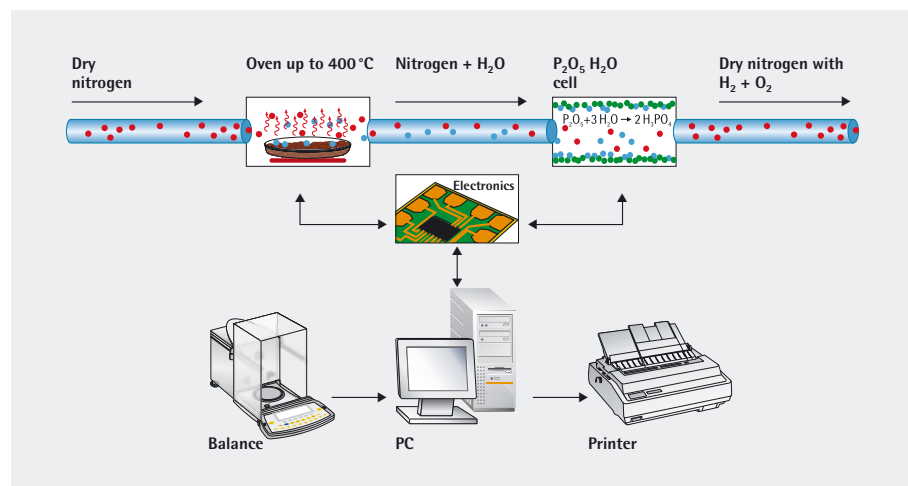
Specifications|Accessories
Water Detection System WDS 400

Specifications

Moisture analysis method	Thermal analysis followed by coulometric measurement
Sample heating in the built-in stainless steel oven (convection heating)	From room temperature up to 400°C; adjustable in increments of 1°C
Detection limit	1 µg of water
Reproducibility	±2% of the absolute water value measured (depends on sample)
Measuring range	1 ppm to approx. 40% water (depends on sample)
Sample weight, average	15–2,000 mg
Display	ppm/% and µg water, mA current
Analysis time	Average: 10–20 min│adjustable in increments of 1 min–10 h
Operator guidance│Software	English, for PCs with Windows® 2000│NT│XP
Data storage	On the hard drive of the interfaced PC
Number of measuring programs	Limited only by the PC's hard drive memory
Power supply	115│230 V ±10 %
Frequency	50 ... 60 Hz
Carrier gas	– Dry room air (using integrated air pump with molecular sieve) – Nitrogen, N_2 (Class 5.0)
Gas prepressure	1 bar (15 psi)
Gas consumption	100–200 ml/min
Power consumption	Standby 100 W│At full power 600 W
Dimensions (W × D × H)	500 × 500 ×180 mm
Weight	20 kg

Accessories

Regeneration kit for electrochemical cell	69MA0224
Calibration standard	69MA0225
PTFE particle-removing filters starting from serial no. 19070049	69MA0226
PTFE particle-removing filters up to serial no. 19170000	69MA0292
Nickel scoops for weighing samples	69MA0228
Electrochemical cell, uncoated	69MA0232
Molecular sieve for drying unit	69MA0293
Flexible gas tubing, stainless steel, for external gas supply, approx. 2 m	69MA0229

Recommended balance models

Semi-microbalances	ME235S	ME235P	CPA225D
Weighing range structure	SuperRange	PolyRange	DualRange
Weighing capacity (g)	230	60│110│230	80│100│220
Readability (mg)	0.01	0.01│0.02│0.05	0.01│0.1

Microbalances	SE2	ME5	ME36S	CPA2P	CPA26P
Weighing range structure	SuperRange	SuperRange	SuperRange	PolyRange	PolyRange
Weighing capacity (g)	2.1	5.1	31	0.5│1│2	5│21
Readability (µg)	0.1	1	1	1│2│5	2│10

Sartorius LMA320PA
Moisture Analysis in a Fraction of a Second

Product Profile

Sartorius moisture analyzers of the LMA300 series are designed for fast moisture analysis and density determination in the lab or during at-line operation.

Thanks to their modular construction, these analyzers can be connected to a variety of different sensor types, depending on sample properties and moisture range.

Thanks to their microwave resonance technology, the overall moisture, i.e. both the surface moisture and core moisture are determined.

Their microwave resonance technology offers the advantage of extremely fast measurements that take less than a second. Measurement is non-destructive, which means that the samples can be used for subsequent tests. Changes in the color and surface structure of the sample, as is frequently the case, for instance, in natural raw materials, have no effect on the measured result.

Every sensor is equipped with a recognition chip that transmits all relevant sensor data to the electronics unit. That also means it is configured automatically (plug and play).

The proprietary biparametric measurement permits water content analysis of the sample that is independent of its density.

The user-friendly Moisture View software offers a multitude of options for operating the analyzer, for presenting and managing measured values, not to mention its extensive statistics and export functions.

Moisture View features a hierarchical user administration with log files and context-sensitive help function.

With the novel calibration function, calibrations can be performed in different moisture ranges with a variety of regression coefficients (linear|high-order).

Additionally, calibrations can be issued easily and reliable with the built-in auto calibration feature. The software automatically establishes the appropriate regression type to match the moisture range.

Any temperature extremes in the sample are compensated for automatically.

Application Options

The moisture content of materials is one of the most important parameters involved in the production and processing of foods, chemicals and pharmaceutical products.

It has a critical effect on product quality, processing and stability.

By optimizing product water content during production, costs for raw materials and energy can be saved effectively.

That is why fast, reliable and precise moisture analysis is vital - from incoming goods inspection to outgoing goods inspection, in the lab or during at-line production. Moisture analyzers of the LMA300 series have been designed especially for such applications. The proprietary measuring method enables split-second moisture analysis without sample pretreatment and independent of the sample's density.

By this method, the production process can be monitored, controlled and optimized on a timely basis.

Specifications│Accessories
LMA320PA

Technical Specifications

LMA320PA–000U (With Touch Display)

Operation by touch display (8.4") or interfaced PC
(not included with the Equipment Supplied),
Moisture View operating software

LMA315PA–000U (Without Touch Display)

Operation via interfaced PC (not included
with the Equipment Supplied), Moisture View
operating software

Housing	Plastic and aluminum
Dimensions (W × H × D)	500 × 430 × 200 mm
Weight	11.5 kg
Voltage	110 – 230 V AC
Frequency	50...60 Hz
Interfaces	1 × Ethernet 3 × USB 1 × Analog input (0│4–20 mA) for optional IR temperature sensor Interface port for PT-100 temperature sensor Interface ports for PS2 mouse, keypad, printer, VGA monitor 1 × RS-232 serial interface (modem, service)
Automatic sensor recognition	Yes
Measuring range	0.05–approx. 60% moisture, RATIO 0.05 – 150% (sample-dependent)
Reproducibility	+/- 0.05% standard deviation for a 10-fold determination (sample-dependent)
Measuring time	< 1 sec., (> 800 single measurements/sec.)
Temperature compensation	Automatic
Product data memory	Unlimited
Sample temperature	0 – 70℃ (automatic temperature compensation)
Ambient temperature	0 – 40℃

** In addition to the LMA300PR sensor module, other sensors are also available on request. Depending on the desired application,
however, the technical specifications will have to be agreed on with a Sartorius applications technician.

Optional Accessories	Order no.
Applicator, 60 mm	69MA0294
Applicator, 140 mm	69MA0295
Reference standard	LMA301SY

Sensor Specifications	LMA330RH–040B	LMA330RH–050B	LMA330RH–046	LMA330RE–026	LMA330RE–026
Dimensions (mm)	370×245×275	370×245×275	370×395×375	260×270×280	370×385×375
Weight	10 kg	10 kg	11 kg	5 kg	15 kg
Sample volume	(60│150) ml	(90│125) ml	400 ml	27 ml	2000 ml
Resonator diameter	40 mm	50 mm	46 mm	26 mm	96 mm

Sartorius PMD320PA and PMD325PA
Online Moisture Analysis in a Fraction of a Second

Product Profile

Sartorius moisture analyzers of the PMD300 series are designed for online moisture analysis and density determination within production processes.

Thanks to their microwave resonance technology, the overall moisture, i.e. both the surface moisture and core moisture are determined.

Their microwave resonance technology offers the advantage of extremely fast measurements that take less than a few milliseconds. This feature also allows products conveyed at extremely high speeds to be analyzed accurately.

The individual measurements are averaged over a user-defined period to ensure that even minor fluctuations in moisture content are detected along the product flow.

Changes in the color and surface structure of the sample, as is frequently the case, for instance, in natural raw materials, have no effect on the measured result.

The proprietary biparametric measurement permits water content analysis of the sample that is independent of its density.

Thanks to their modular construction, these analyzers can be connected to a variety of different sensor types, depending on sample properties and moisture range.

The user-friendly Moisture View software offers a multitude of options for operating and configuring the analyzer, for presenting and managing measured values, not to mention its extensive statistics and export functions.

Moisture View features a hierarchical user administration with log files and context-sensitive help function.

With the novel calibration function, calibrations can be performed in different moisture ranges with a variety of regression coefficients (linear|high-order).

Calibrations can be issued easily and reliably with the built-in auto calibration feature.
The software automatically establishes the appropriate regression type to match the moisture range.

Any temperature extremes in the sample are compensated for automatically.

Application Options

The moisture content of materials is one of the most important parameters involved in the production and processing of foods, chemicals and pharmaceutical products.

It has a critical effect on product quality, processing and stability.

That is why fast, reliable and precise moisture analysis is vital - from incoming goods inspection to outgoing goods inspection, in the lab or at-line during production.

With inline moisture analyzers from Sartorius, key steps can be monitored, documented and controlled throughout the process.

This method minimizes fluctuations in the product's water content.

This also promotes strict compliance with legal regulations and their documentation; out-of-specification batches can be generally avoided.

Because the product's water content can be optimized, valuable resources like raw materials and energy are conserved. Savings on production costs are also achievable.

Moisture analyzers of the PMD300 series have been designed especially for such applications.

Upon request, every analyzer can be supplied in a version for use in hazardous environments and explosive atmospheres.

Thanks to the large number of different interfaces available, these analyzers can be seamlessly integrated into all electronic data-related processes.

Specifications|Accessories
PMD320PA and PMD325PA

Technical Specifications

PMD320PA–000U

Operation via interfaced PC (not
included with the Equipment Supplied),
Integrated 5" LC display
Moisture View operating software

PMD325PA–000U

Operation by 10.4" touch display or
interfaced PC (not included with the
Equipment Supplied), Moisture View
operating software

PMD320PA and PMD325PA

Housing	Stainless steel
Dimensions (W × H × D)	410 × 460 × 210 mm
Weight	19.0 kg
Voltage	110–230 V AC
Power consumption	70 to 90 VA
Frequency	50 ... 60 Hz | 70 VA
Protection class	IP 54
Systems for use in hazardous environ-ments and explosive atmospheres	Upon request
Interface data	1 × RS-422 (for PC, max. 1200 m cable length) 1 × Serial RS-232 (modem, service) 1 × Ethernet (max. cable length, 100 m) 1 × Analog input (0 | 4 – 20 mA) 3 × Analog output (SPS, process monitoring and control) (0 | 4 – 20 mA), active, potential-free 8 × Potential-free digital inputs (optokoppler, 24 V) 8 × Potential-free digital outputs (24V, 0.25 A DC)
Automatic sensor recognition	Yes
Measuring range	0.1–approx. 60% moisture, RATIO 0.1 – 150% (sample-dependent)
Reproducibility	+/- 0.08% standard deviation for a 10-fold determination (sample-dependent)
Measuring time	< 1 sec., (> 800 single measurements/sec.)
Product data memory	Unlimited
Sample temperature	0– 70°C (automatic temperature compensation, temperature sensor integrated in sensor)
Ambient temperature	0 – 40°C
Maximum distance between electronics and sensor	3 m

PMD500 Series Process Analyzer with NIR Technology

Product Profile

The rugged online analyzers from the Sartorius PMD500 series are designed for process analysis and control.

These ultra-modern, high-tech optical analyzers feature a unique and flexible array of detectors for the UV|VIS and NIR spectra in compelling combination with a high-resolution digital camera and a comprehensive software package. Concentrations of ingredients, like water, moisture, fat, protein, solvent etc., can be determined accurately in online measurements. The process can be monitored and controlled in real time, thereby narrowly limiting fluctuations in concentration within the process. Valuable resources like raw materials and energy are conserved. Huge savings on production costs are also achievable.

Thanks to the extremely short integration times, products conveyed at extremely high speeds can also be analyzed.

All analyzers have ATEX approval and are rated with IP 65 protection class, their housings are made of stainless steel.

A comprehensive range of accessories guarantees that the hardware of the sensor systems is integrated into the process.

Thanks to the large number of different interfaces available, these analyzers can be seamlessly integrated into all electronic data-related processes.

Similarly, a comprehensive range of available tools enables flexible integration into your daily laboratory process.

Areas of Application

Completeness control of individual components is indispensable, particularly in mixing processes. Supported by the library of spectra storable in the PMD500 process analyzer, each individual component and ingredient is checked. If an ingredient stored in the formulation is found to be missing, a signal is automatically triggered which allows the process to be stopped in time.

End-point determination in a mixing process is equally as important, in other words, detecting the degree of homogeneity of a mixture. During this process, measurement of the variances in the mixture's spectrum using the PMD500 process analyzer takes place contact-free, i.e. at a distance of up to 50 cm. If these variances are within a predefined interval, the mixing process can be stopped. This method allows the process to be stopped at the exact time the ideal mixture has been produced, without waiting until a certain period has elapsed. That makes the process less time-consuming and thus more efficient. In addition, online monitoring gives more transparence to the mixing process and allows for easier documentation.

Identification and purity testing of materials is indispensable for incoming goods inspection. The current spectrum of the respective substance is compared with the spectra stored in the spectral library of the analyzer. If these spectra deviate, an alarm can be triggered and acceptance of the incoming goods is automatically interrupted. This ensures that only labelled goods are accepted that actually fulfill the specified degree of purity. Online analysis helps ensure process reliability in a major way.

The PMD500 process analyzer is additionally supplied with a high-resolution digital camera (optional). The camera detects optical features of a sample, for instance, black specks in flour, also called "bad spots" are identified in time.

Advantages

Online monitoring supplements many laboratory analyses by performing 100% in-process measurements. Calibration using the existing reference method produces consistent traceability within the scope of inspection equipment monitoring. With results being generated in split seconds, processes can be monitored and automatically controlled in real time. This makes many of the process steps more transparent and markedly minimizes fluctuations in the product. Efficiency is enhanced, production costs slashed and process reliability heightened.

Specifications
PMD500

Technical Specifications

All

Dimensions (W × D × H)	220 × 220 × 135 mm
Weight	7 kg
Operating temperature range	-10.... +40℃
Humidity	Highest relative humidity < 90%, non-condensing
Operating pressure	30 bar
Vibrations	0.2 G at 0.1 – 150 Hz
Light source type│Lifetime	2 tungsten halogen light sources │ MTBF > 18,000 h

Interfaces	*Bluetooth®* up to 10 m RS-232 RS-422 up to 2 km
Protection class	ATEX: EX II D 1/2 IP65 T80 Upon request: ATEX: EX II G 1/2 IP67 T80
Measuring time	10 ms, typical
Optical measuring surface (except for PMD beam, PMD light)	d=4 cm
Detector type (spectrometer)	Diode array
Special feature(s)	Automatic referencing black │ white comparison

PMD511–000U	PMD One online system 950 – 1750 nm
Spectrometer	950 – 1750 nm; NIR

PMD510–000U	PMD One online system 350 – 920 nm
Spectrometer	350 – 920 nm; UV│VIS

PMD521–000U	PMD Two online system 950 – 1750 nm + CCD
Spectrometer	950 – 1750 nm; NIR
High-resolution CCD camera, resolution	80 µm

PMD520–000U	PMD Two online system 350 – 920 + CCD
Spectrometer	350 – 920nm; UV│VIS
High-resolution CCD camera, resolution	80 µm

PMD532–000U	PMD Three online system NIR, UV│VIS
Spectrometer	950 – 1750 nm; NIR
Spectrometer	350 – 920 nm; UV│VIS

PMD542–000U	PMD Four online system NIR, UV│VIS, CCD
Spectrometer	950 – 1750 nm; NIR
Spectrometer	350 – 920 nm; UV│VIS
High-resolution CCD camera, resolution	80 µm

PMD551–000U	PMD Beam online system NIR
Spectrometer	950 – 1750 nm; NIR
Max. distance to product	Approx. 40 cm
Optical measuring surface	Approx. d=10 cm
Special feature(s)	Variable distance between sample and optics: 0 – 40 cm

PMD552–000U	PMD Beam online system NIR, UV│VIS
Spectrometer	950 – 1750 nm; NIR
Spectrometer	350 – 920 nm; UV│VIS
Max. distance to product	Approx. 50 cm
Optical measuring surface	Approx. d=10 cm
Special feature(s)	Variable distance between sample and optics: 0 – 40 cm

PMD503–000U	PMD view online system CCD
Without spectrometer	
High-resolution CCD color camera, Resolution	80 µm

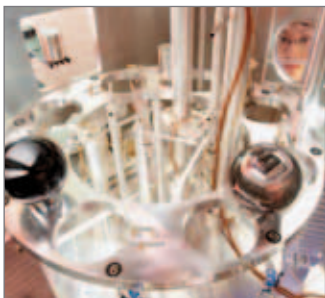| **PMD590–000U**	PMD Light
For large-area measurements with internal reference	
Measuring distance	From 20 to 40 cm
Measuring spot	From 10 to 30 cm ⌀
Appropriate for conveyor belts	
Automatic referencing	
For PMD One only	
Traverse frame, not included	

sartorius

Mass Metrology

Automatic Mass Comparators and Robots

CCL1007

Load alternator CCL1007

CCR10-1000

Weight grabber CCR10-1000

The fascination of precision
International trade requires the worldwide standardization of certain measurements. Mass plays an important role, because the majority of commerce throughout the world is defined by the mass of substances. To make sure the same masses are used around the world, each country has a national metrology institute (NMI) that governs units of measurement. These institutes are the measure of all things.

Mass determination to the most exacting standards
On behalf of and in collaboration with the NMIs, Sartorius develops innovative mass comparators to the highest standards.

Sartorius has mastered the core disciplines of weighing like no other company, and sets new standards in mass metrology. In cooperation with the Bureau International des Poids et Mesures and the Institute for Process Measurement and Sensor Technology of the Technical University of Ilmenau, Sartorius has developed a mass comparator – the CCL1007 – that is capable of determining differences in mass to an accuracy of 0.1 µg for weights of 1 kg – even under high-vacuum conditions.

Our metrology experts will be happy to advise you, offering the best solution available to meet your needs.

Automatic mass comparators and robots

Model	Maximum load	Readability	Typical Repeatability*	R = Robot A = Automatic
CCL1007	1,031 g	0.1 µg	0.1 µg	A 8 positions
CCR10	10.5 g	0.1 µg	0.2 µg	R 39–104 positions
CCR1000	1,002 g	1 µg	2 µg	R 21-60 positions
CCR10-1000	10.5 g 1,002 g	0.1 µg 1 µg	0.2 µg 2 µg	R 39–104 positions R 21-60 positions
CCE1000S-L	1.002 kg	0.001 mg	0.001 mg	A 4 positions
CCE10000U-L	10.05 kg	0.01 mg	0.01 mg	A 4 positions
CCE10000S-L	10.05 kg	0.1 mg	0.1 mg	A 4 positions
CCE20000S-L	20.05 kg	0.1 mg	0.1 mg	A 4 positions
CCE50001S-L	51 kg	1 mg	1 mg	A 2 positions

* Repeatability is the standard deviation "s"; it is calculated from 6 ABBA cycles, after eliminating drift.

Manual Mass Comparators
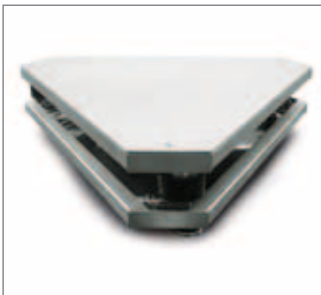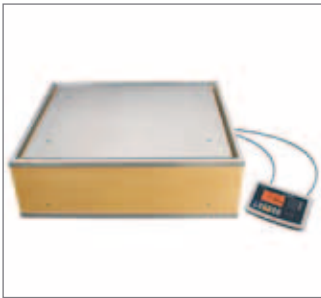
Specifications

Model	Maximum load (g)	Readability (mg)	Typical repeatability (s in mg)*
Analytical range			
CCE6	6.1	0.0001	0.00015
CCE36	31	0.001	0.001
CCE66	61	0.001	0.001
CCE111	111	0.001	0.001
CCE605	610	0.01	0.015
CCE1005	1,110	0.01	0.01
Universal range			
CCE1004	1,200	0.1	0.05
CCE2004	2,500	0.1	0.1
CCE5004	5,100	0.2	0.3
CCE5003	5,100	1	0.5
CCE10000S	10,050	0.1	0.1
CCE10K3	11,000	1	1
CCE20000	20,050	1	1
CCE40K3	41,000	2	3
CCE60K3	64,000	2	4
CCE60K2	64,000	10	7
Research and testing range			
CCI60K2	64,000	50	100
CCI100K2	151,000	50	200
CCI300K	303,000	1,000	500
CCS600K	605,000	1,000	2,000
CCT1000K	1,200,000	1,000	2,000
CCS1000K	1,510,000	5,000	5,000
CCT2000K	2,010,000	1,000	5,000
CCS3000K	3,010,000	1,000	10,000

* Repeatability is the standard deviation "s"; it is calculated from 6 ABA cycles, after eliminating drift.

Accessories for Mass Determination
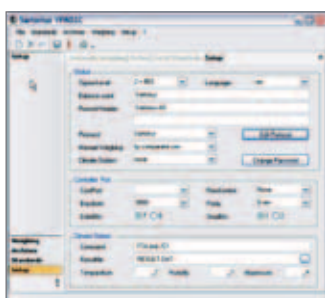
Density determination

	Model	Maximum load	Readability	Typical repeata-bility
Volume comparator with 2 load alternators	VD1005	1,125 g	0.01 mg	0.02 mg
Volume comparator with load alternator	VL1005	1,125 g	0.01 mg	0.02 mg
Pycnometer for weights up to 50 kg	YP50K	50 kg		
Density reference: 1 kg silicon sphere	YDR1000SIC			
Density reference: 500 g silicon sphere	YDR500SIC			
Density reference: 200 g silicon sphere	YDR200SIC			

Analysis of magnetic properties

	Model	Maximum load	Readability	Typical repeata-bility
Susceptometer for weights up to 50 kg	YSZ01C	50 kg	10 µg	10 µg
Susceptometer for weights up to 50 kg	YSZ02C	50 kg	1 µg	5 µg
Calibration kit for susceptometer	YSZ01RMC			
Susceptibility reference (1 kg)	YSZ01RMC			
Permeability indicator	YAW61			

Software for mass determination

	Model
ScalesNet	YSN01C
ScalesNet additional software licenses	YSN01LC
ScalesNet V4, license for mass dissemination	YSN01MC
Data Logger converter (RS232 → LAN)	YSN01DC
Evaluation program for mass metrology	YPR02C

Air density determination

	Model
Climate station for an E1 laboratory	YCM02C
Climate station for an E2 laboratory	YCM03C
Precision climate station for an E1 laboratory	YCM05C

Draft shields

	Model
for CCE10000S-L, CCE10000U-L, CCE20000S-L	YDS01C
for CCE1000S-L	YDS44C
for CCE40K3, CCE60K3, CCE60K2	YDS03C
for CCE40K3, CCE60K3, CCE60K2	YDS05C
for CCE6, SE2, ME5	YDS20C
for CCE111	YDS22C
for CCE1004, CCE2004, CCE5004, CCE5003	YDS24C
for CCE36, CCE66, CCE505, CCE1005	YDS26C
for CCI60K2	YDS62C
for CCI100K2, CCI300K	YDS64C
for CCS600K, CCS1000K	YDS80C
for CC3000K	YDS82C
for CCT1000K	YDS85C
for CCT2000K	YDS87C

Weights and Weight Sets (YCW, YCS)

The complete line – ranging from weights to certified testing services

Regular inspection and testing of weighing instruments are a must to ensure reliable weighing results. Sartorius offers highly accurate metrological weights and weight sets with nominal mass values from 1 mg to 1,000 kg, special and test weights, as well as the accessories required for correct handling and storage of weights.

Sartorius weights and weight sets are calibrated by the DKD* and comply with the International Recommendation OIMLR111: 2004. They are therefore suitable for legal and general metrological applications in research and industry.

Sartorius weights meet the requirements for traceability to the national kilogram prototype in conformance with ISO 9001:2000. These weights help support your quality management and quality assurance systems, and fulfill GLP and GMP requirements.

Your DKD partner for mass units

Sartorius is a DKD calibration laboratory for both weights and electronic laboratory balances and industrial scales. Sartorius calibration laboratories have been inspected and accredited for compliance with the regulations of the German calibration service, DKD, concerning mass units and meet the DIN EN ISO IEC 17025 international standard for test laboratories.

Recalibration for any brand names, manufacturers and designs

Depending on how frequently weights are used, they must be recalibrated on a regular basis so that they meet the requirements for reliable measuring, inspection and test equipment. Sartorius offers recalibration service along with DKD calibration certificates for all weights ranging from 1 mg to 50 kg, regardless of their design or brand name, and up to 500 kg for F2 and M1 weights.

Here's how to find the right test weight

Just determine the number of digits specified for your weighing instrument's resolution, then check the graph below for the particular accuracy class that your test weight must have.

The weight value of your test weight should be more than 80% of the maximum capacity of your weighing instrument.

Use the following chart to determine whether you need an individual weight or a weight set by comparing the nominal mass values.

Example: Suppose your weighing instrument has a capacity of 2,200 g and a readability of 0.01 g. This yields 220,000 digits, which correspond to a class E2 test weight. Since 80% of 2,200 g is 1,760 g, you need to round it to a weight value of 2,000 g.

Nominal value
Steps

$n = m:d$
n = resolution of your weighing instrument (digits)
max = weighing capacity of your instrument
d = readability of your instrument

1,000,000
500,000
100,000
50,000
10,000
5,000

M1 F2 F1 E2 E1* Class

* or E2, DKD-calibrated
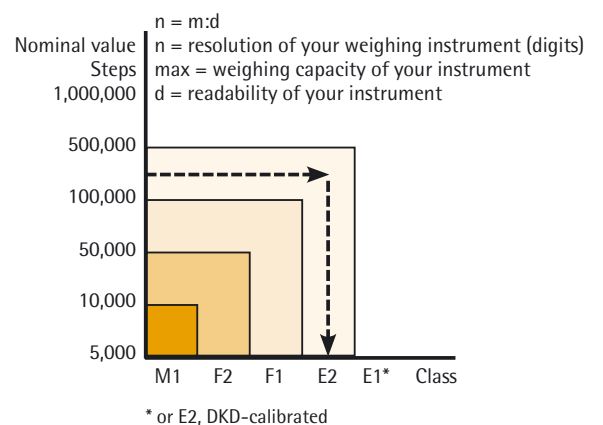
Metrological Weight Sets in Wooden Cases with Forceps*

Weight sets

Composition of the weight sets

● Weight without marking
○ Weight with marking

Range	Contents	mg	g	kg
1 mg – 5 g Total contents: 11.11 g 16 pcs	1	●	●	
	2	●○	●○	
	5	●	●	
	10	●		
	20	●○		
	50	●		
	100	●		
	200	●○		
	500	●		
1 mg – 100 g Total contents: 211.11 g 21 pcs	1	●	●	
	2	●○	●○	
	5	●	●	
	10	●	●	
	20	●○	●○	
	50	●	●	
	100	●	●	
	200	●○		
	500	●		
1 mg – 200 g Total contents: 611.11 g 23 pcs	1	●	●	
	2	●○	●○	
	5	●	●	
	10	●	●	
	20	●○	●○	
	50	●	●	
	100	●	●	
	200	●○	●○	
	500	●		
1 mg – 1 kg Total contents: 2,111.11 g 25 pcs	1	●	●	●
	2	●○	●○	
	5	●	●	
	10	●	●	
	20	●○	●○	
	50	●	●	
	100	●	●	
	200	●○	●○	
	500	●	●	
1 mg – 5 kg Total contents: 11,111.11 g 28 pcs	1	●	●	●
	2	●○	●○	●○
	5	●	●	●
	10	●	●	
	20	●○	●○	
	50	●	●	
	100	●	●	
	200	●○	●○	
	500	●	●	
1 g – 1 kg Total contents: 2,110 g 13 pcs	1		●	●
	2		●○	
	5		●	
	10		●	
	20		●○	
	50		●	
	100		●	
	200		●○	
	500		●	
1 g – 5 kg Total contents: 11,110 g 16 pcs	1		●	●
	2		●○	●○
	5		●	●
	10		●	
	20		●○	
	50		●	
	100		●	
	200		●○	
	500		●	
1 g – 10 kg Total contents: 21,110 g 17 pcs	1		●	●
	2		●○	●○
	5		●	●
	10		●	●
	20		●○	
	50		●	
	100		●	
	200		●○	
	500		●	

* 1 kg and up: glove included

Weight Sets (YCS)

Features of Sartorius weight sets
The weights contained in Sartorius weight sets have the same features and properties as the individual weights in the corresponding maximum permissible errors. Sartorius weight sets are supplied in a wooden case, along with gloves, forceps and brushes.

Service weight sets come in a plastic case for mobile maintenance of balances and scales.

Class E1 and E2 weight sets come with wire weights up to 500 mg.

Class F1, F2 and M1 weight sets come with leaf weights up to 500 mg.

Nominal mass	E1	E2	F1
From 1 mg to 5 g	YCS011-351-0X	YCS011-352-0X	
From 1 mg to 100 g	YCS011-511-0X	YCS011-512-0X	YCS01-513-0X
From 1 mg to 200 g	YCS011-521-0X	YCS011-522-0X	YCS01-523-0X
From 1 mg to 1 kg	YCS011-611-0X	YCS011-612-0X	YCS01-613-0X
From 1 mg to 5 kg	YCS011-651-0X	YCS011-652-0X	YCS01-653-0X
From 1 g to 1 kg	YCS31-611-0X	YCS31-612-0X	YCS31-613-0X
From 1 g to 5 kg	YCS31-651-0X	YCS31-652-0X	YCS31-653-0X
From 1 g to 10 kg	YCS31-711-0X	YCS31-712-0X	YCS31-713-0X

Nominal mass	F2	M1
From 1 mg to 100 g	YCS01-514-0X	YCS01-515-0X
From 1 mg to 200 g	YCS01-524-0X	YCS01-525-0X
From 1 mg to 1 kg	YCS01-614-0X	YCS01-615-0X
From 1 mg to 5 kg	YCS01-654-0X	YCS01-655-0X
From 1 g to 1 kg	YCS31-614-0X	YCS31-615-0X
From 1 g to 5 kg	YCS31-654-0X	YCS31-655-0X
From 1 g to 10 kg	YCS31-714-0X	YCS31-715-0X

Service weight set	E2	F1
From 100 g to 5 kg	YSS5128-6528-0X	
From 1 g to 5 kg		YSS3138-6538-0X

Options:
X = 0: weights with DKD certificate in Sartorius's name (E2, F1, F2 – 50 kg)
X = 2: weights with DKD certificate in customer's name
YCW02: DKD calibration certificate with customer data

mg Weights (YCW)

Knob weights

Leaf weights

Wire weights

Features of Sartorius weights
Class F1 leaf weights (F2, M1 in weight sets);
individual weights available on request
1– 5 mg aluminum; density 2.7 g/cm^3
10– 500 mg nickel silver; density 8.6 g/cm^3

Class E1 and E2 wire weights
1– 500 mg special steel,
non-magnetizable
E1; density 8.0 g/cm^3
E2; density 7.95 g/cm^3

Nominal mass	Wire weights Class E1	Wire weights Class E2	Leaf weights Class F1
1 mg	YCW0111–0X	YCW0121–0X	YCW013–0X
2 mg	YCW0211–0X	YCW0221–0X	YCW023–0X
5 mg	YCW0511–0X	YCW0521–0X	YCW053–0X
10 mg	YCW1111–0X	YCW1121–0X	YCW113–0X
20 mg	YCW1211–0X	YCW1221–0X	YCW123–0X
50 mg	YCW1511–0X	YCW1521–0X	YCW153–0X
100 mg	YCW2111–0X	YCW2121–0X	YCW213–0X
200 mg	YCW2211–0X	YCW2221–0X	YCW223–0X
500 mg	YCW2511–0X	YCW2521–0X	YCW253–0X

Options:
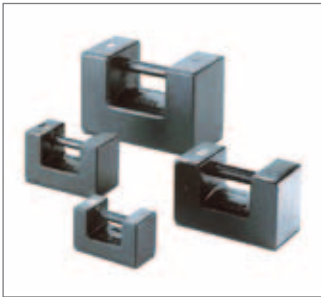X = 0: weights with DKD certificate in Sartorius's name (E2, F1, F2 – 50 kg)
X = 2: weights with DKD certificate in customer's name
YCW02: DKD calibration certificate with customer data

Weights (YCW)

Class E1, E2, F1 and F2 knob weights
1 g to 50 kg, special steel,
non-magnetizable
E1; density 8.0 g/cm³
E2, F1, F2; density 7.95 g/cm³

M1: 1-10 kg, brass|galvanized,
shiny polished
Packaging of the weights:
up to 20 g in a plastic box
from 50 g in a wooden case
from 1 kg: glove included

Knob weights

Block weights

Cylindrical weights

**Knob weights
(100 kg and up: cylindrical weights)**

Nominal mass	E1 (1)	E2 (1)	F1 (1)	F2 (1)	M1 (2)	M2 (3)
1 g	YCW311-0X	YCW312-0X	YCW313-0X	YCW314-0X		YCW316-0X
2 g	YCW321-0X	YCW322-0X	YCW323-0X	YCW324-0X		YCW326-0X
5 g	YCW351-0X	YCW352-0X	YCW353-0X	YCW354-0X		YCW356-0X
10 g	YCW411-0X	YCW412-0X	YCW413-0X	YCW414-0X		YCW416-0X
20 g	YCW421-0X	YCW422-0X	YCW423-0X	YCW424-0X		YCW426-0X
50 g	YCW451-0X	YCW452-0X	YCW453-0X	YCW454-0X		YCW456-0X
100 g	YCW511-0X	YCW512-0X	YCW513-0X	YCW514-0X		YCW516-0X
200 g	YCW521-0X	YCW522-0X	YCW523-0X	YCW524-0X		YCW526-0X
500 g	YCW551-0X	YCW552-0X	YCW553-0X	YCW554-0X		YCW556-0X
1 kg	YCW611-0X	YCW612-0X	YCW613-0X	YCW614-0X	YCW615-0X	YCW616-0X
2 kg	YCW621-0X	YCW622-0X	YCW623-0X	YCW624-0X	YCW625-0X	YCW626-0X
5 kg	YCW651-0X	YCW652-0X	YCW653-0X	YCW654-0X	YCW655-0X	YCW656-0X
10 kg	YCW711-0X	YCW712-0X	YCW713-0X	YCW714-0X	YCW715-0X	YCW716-0X
20 kg	YCW721-0X	YCW722-0X	YCW723-0X	YCW724-0X		
50 kg	YCW751-0X	YCW752-0X	YCW753-0X	YCW754-0X		
100 kg			YCW813-00	YCW814-0X*	YCW8157-0X	
200 kg			YCW823-00	YCW824-0X*	YCW8257-0X	
500 kg			YCW853-00	YCW854-0X*	YCW8557-0X	
1,000 kg			YCW913-00	YCW914-00*	YCW9157-0X	

* Cylindrical weight with lug

Nominal mass	Block weights (1) M1	Block weights (4) M1	Block weights (4) M2
5 kg	YCW6554-0X	YCW6559-0X	
10 kg	YCW7154-0X	YCW7159-0X	
20 kg	YCW7254-0X	YCW7259-0X	
50 kg	YCW7554-0X	YCW7559-0X	
100 kg		YCW8159-0X	YCW6569-0X
200 kg**		YCW8259-0X	YCW7169-0X
500 kg**		YCW8559-0X	YCW7269-0X
1,000 kg**		YCW9159-0X	YCW7569-0X

Block weight, stainless steel

Block weight

* Cylindrical weight with lug for crane
** Cylindrical weight with lug for crane, stackable

Material:
(1) stainless steel, (2) galvanized brass, (3) brass, precision lathed surface,
(4) Material: gray casting, painted black

Options:
X = 0: weights with DKD certificate in Sartorius's name (E2, F1, F2 – 50 kg)
X = 2: weights with DKD certificate in the customer's name
YCW02: DKD calibration certificate with customer data

Test Weights (YCW...8)

Features of Sartorius test weights
Stainless steel, non-magnetizable,
density 7.9 g/cm^3, shiny polished;
packaging:
in a plastic screw-top can with
DKD certificate in Sartorius's name

Test Weights

Nominal mass	E2	F1	F2
1 g	YCW3128-00	YCW3138-00	
2 g	YCW3228-00	YCW3238-00	
5 g	YCW3528-00	YCW3538-00	
10 g	YCW4128-00	YCW4138-00	
20 g	YCW4228-00	YCW4238-00	
50 g	YCW4528-00	YCW4538-00	
100 g	YCW5128-00	YCW5138-00	YCW5148-00
200 g	YCW5228-00	YCW5238-00	YCW5248-00
500 g	YCW5528-00	YCW5538-00	YCW5548-00
1 kg	YCW6128-00	YCW6138-00	YCW6148-00
2 kg	YCW6228-00	YCW6238-00	YCW6248-00
5 kg	YCW6528-00	YCW6538-00	YCW6548-00
10 kg		YCW7138-00	YCW7148-00

Option:
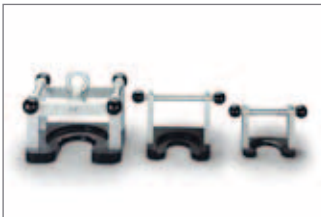YCW02: DKD calibration certificate with customer data

Accessories for Weights (YAW)

Forceps

Weight forks

Handles for lifting weights

Permeability indicator

Susceptometer

Clean room weight case

Accessories for Sartorius weights

Sartorius offers glass bell jars with a support plate, plastic cases, brushes, gloves, forceps with silicone-coated tips, weight forks, handles for lifting weights and a permeability indicator (for checking magnetic properties of weights of accuracy classes E1, E2, F1 and F2).

In addition, Sartorius supplies susceptometers for easy and convenient determination of the susceptibility and magnetization of weights in accordance with OIML R111: 2004.

Accessories		Order No.
Glass bell jar with support plate	for 1 mg – 5 g	YAW00
	for 1 mg – 50 g (100 g or 200 g)	YAW01
	for 100 g – 1 kg (2 kg)	YAW02
	for 2 kg – 5 kg	YAW03
	for 10 kg	YAW04
	for 20 kg	YAW05
	for 50 kg	YAW06
Brush	small, 100 mm	YAW11
	medium, 115 mm	YAW12
	large, 150 mm	YAW13
	extra large, 250 mm	YAW14
Pair of gloves	Cotton	YAW21
	Leather	YAW22
Forceps with silicone-coated tips	115 mm for 1 mg – 5 g	YAW31
	160 mm for 1 g – 200 g	YAW32
	230 mm for 1 g – 1 kg	YAW33
Weight forks	for 500 g	YAW41
	for 1 kg	YAW42
	for 2 kg	YAW43
Handles for lifting weights	for 5 kg	YAW50
	for 10 kg	YAW51
	for 20 kg	YAW52
	for 50 kg	YAW53
Permeability indicator	For checking magnetic properties of weights of accuracy classes (OIML R111: 2004) E1, E2, F1 and F2; supplied in a wooden case	YAW61
Susceptometer	Resolution 10 µg	YSZ01C
	Resolution 1 µg	YSZ02C
	For checking magnetic properties of weights of accuracy classes E1, E2, F1 and F2, field of application according to OIML R111: 2004 from 2 g to 50 kg.	
Standard susceptibility reference	1 kg	YSZ01RMC
Calibration kit for susceptometer		YSZ01RMC
Plastic screw-top can for individual weights* with closed-pore insert; also suitable for clean rooms	for 50 g weights	YAW50GL
	for 100 g weights	YAW100GL
	for 200 g weights	YAW200GL
	for 500 g weights	YAW500GL
	for 1 kg weights	YAW1000GL
	for 2 kg weights	YAW2000GL
	for 5 kg weights	YAW5000GL
	for 10 kg weights	YAW10000GL

* for knob weights only; for information on cans for cylinder weights, please contact Sartorius

Electroanalysis
for Laboratories

Sartorius DocuClip® & Docu-pH$_{Meter}$
The New Standard for Reliability in Electrochemical Analysis

Reliability starts with easy and comprehensible operation. With the newly developed Docu-pH$_{Meter}$ instruments, Sartorius is setting new standards in the determination and management of measured values. Equipped with a graphic display and easy-to-use softkeys, all Docu-pH$_{Meter}$ models are practical meters that make even complex laboratory tasks simple.

You can choose between "intelligent" electrodes connected to DocuClip® or standard electrodes with a BNC connector.

Comprehensive features – simple results

– Graphical display and softkeys

– Easy-to-understand menu-driven prompts in plain language

– Defined function keys for the most common applications; no double-assigned keys

– Fast mode for rapid results

– Automatic recognition of the DocuClip®

– Automatic recognition of a variety of temperature probes

– Serial interface for data transfer to computer or printer (Docu-pH+$_{Meter}$)

– Data storage capacity for 500 data records (Docu-pH+$_{Meter}$)

Give your electrodes an identity. DocuClip® is a unique device that makes an electrode uniquely identifiable, in just seconds. Equipped with built-in memory for calibration data, DocuClip® works together with the Sartorius Docu-pH$_{Meter}$ to store essential electrode specifications over its entire service life.

Electrode data is logged 100% automatically in each measurement, and can be sent to a printer or exported to a computer for further processing.

Specifications

Temperature measurement	Docu-pH$_{Meter}$	Docu-pH+$_{Meter}$
Temperature measuring range in °C	–5 … 105	–5 … 105
Readability in °C	0.1	0.1
Accuracy in °C	± 0.2	± 0.2
Temperature compensation	Automatic or manual from –5°C … 105°C	
Buffer recognition	Automatic: technical buffers, DIN|NIST buffers	
Calibration points, max. number	3	3
Date | time battery-supplied	–	×
Sample IDs	–	×
Calibration reminder	–	×
Complete GLP-compliant record | printout	–	×
Memory for measurement data	–	×
Communication with DocuClip®	×	×
Input for pH combination electrodes	BNC	BNC
Input for temperature probes		
NTC 10 kΩ, NTC 30 kΩ, Pt1000	2.5 mm male jack plug	2.5 mm male jack plug
RS232C interface	–	×
Dimensions in mm	89 × 229 × 145	
Weight in kg	1	1

Specifications

pH measurement	Docu-pH$_{Meter}$	Docu-pH+$_{Meter}$
Measuring range	−2,000 … 20,000	−2,000 … 20,000
Readability	0.001 │ 0.01 │ 0.1 configurable	0.001 │ 0.01 │ 0.1 configurable
Accuracy	± 0.005	± 0.005

mV measurement		
Measuring range in mV	−2,000.0 … 2,000.0	−2,000.0 … 2,000.0
Readability in mV	0.1 │ 1 configurable	0.1 │ 1 configurable
Accuracy in mV	± 0.2 < │ 1,000 │ ± 1 > │ 1,000 │	± 0.2 < │ 1,000 │ ± 1 > │ 1,000 │

Choice of Standard Features

Docu-pH$_{Meter}$	Order number	
Measuring instrument incl. electrode retainer arm, technical buffers, AC adapter, operating instructions	Docu-pH	Docu-pH+
... with electrodes and DocuClip® **for unique, 100% traceable data recording** pH electrodes with plastic body, refillable, fiber junction, NTC 10 kΩ	Docu-pH │ P10doc	Docu-pH+ │ P10doc
glass housing, refillable, platinum junction, NTC 10 kΩ		Docu-pH+ │ P11doc
plastic body, gel electrolyte, fiber junction, NTC 10 kΩ	Docu-pH │ P12doc	Docu-pH+ │ P12doc
Plastic body, gel electrolyte, fiber junction	Docu-pH │ P20doc	Docu-pH+ │ P20doc
Glass housing, refillable, platinum junction		Docu-pH+ │ P21doc
... with conventional electrodes pH electrodes with plastic body, refillable, fiber junction, NTC 10 kΩ	Docu-pH │ P10	Docu-pH+ │ P10
glass housing, refillable, platinum junction, NTC 10 kΩ		Docu-pH+ │ P11
plastic body, gel electrolyte, fiber junction, NTC 10 kΩ	Docu-pH │ P12	Docu-pH+ │ P12
Plastic body, gel electrolyte, fiber junction	Docu-pH │ P20	Docu-pH+ │ P20
Glass housing, refillable, platinum junction		Docu-pH+ │ P21
DocuClip® ... for unique, 100% traceable documentation of calibration for any pH electrodes Initialization by the user with Docu-pH$_{Meter}$ (Docu-pH+$_{Meter}$) required	DocuClip®	

Professional Meter: Multitalented Instruments for the Most Sophisticated Measurement Tasks

pH | mV meters, ion meters, conductivity meters. Four models – with all options to meet the highest requirements.

– Large, backlit multifunctional 5.7" VGA graphical display

– Measuring accuracy to ± 0.1 mV

– Automatic temperature compensation

– Menu-driven prompts in plain language

– Automatic recognition of 26 standard buffers (inc. NIST and DIN)

– Automatic checking of your combination electrode's functionality

– Automatic calibration prompt

– Stability indicator

– Help function always available through softkeys

Clear functions – clear advantages

Simultaneous display of a measured value and the temperature, also for parallel measurements of the pH and conductivity, for example

Research-grade – i.e. the highest – accuracy covering a broad range of concentrations

Excellent reliability and repeatability of the measured results

GLP | GMP | ISO-compliant documentation of the calibrations and results

Interface port for connecting a printer or a PC

PP-15 | pH meter for pH and ORP measurements.

Higher resolution to guarantee even greater accuracy in electrochemical analysis.

PP-20 | pH meter and conductivity meter.
In addition to pH measurement, the high-end PP-20 Professional Meter offers research-grade conductivity measurements.

PP-25 | pH-meter and ion-selective meter.
In addition to convenient pH measurement, the PP-25 features the added capability of research-grade ion-selective analysis for a wide range of concentrations.

PP-50 | pH meter, ion-selective meter and conductivity meter combined in a single unit.
The fully professional PP-50 combines all features of the models presented in this catalog. This convenient Professional Meter is designed for use in a broad range of applications in the electrochemical analysis field.

Specifications

pH measurement	PP–15	PP–20	PP–25	PP–50
Measuring range	–2,000 ... 20,000	–2,000 ... 20,000	–2,000 ... 20,000	–2,000 ... 20,000
Calibration points, max. number	5	5	5	5

mV measurement				
Measuring range in mV	±2,000	±2,000	±2,000	±2,000

Temperature measurement				
Temperature measuring range in °C	–5 ... +105	–5 ... +105	–5 ... +105	–5 ... +105

Ion–selective analysis				
Measuring range	–	–	$1.00 \cdot 10^{-9}$ ... $9.99 \cdot 10^{9}$	
Direct potentiometric measurement and incremental modes	–	–	×	×
Calibration points, max. number	–	–	7	7

Conductivity measurement*				
Measuring range in µS/cm	–	0.5 ... 20,000	–	0.5 ... 20,000
Specific electrical resistance Measuring range in Ω · cm	–	50 ... $2.0 \cdot 10^{6}$	–	50 ... $2.0 \cdot 10^{6}$
Salinity Measuring range in ppt	–	0.01 ... 42.0	–	0.01 ... 42.0
NaCl content Measuring range in ppt	–	0.01 ... 70.0	–	0.01 ... 70.0
TDS Measuring range in mg/l	–	0.005 ... 300,000	–	0.005 ... 300,000
Calibration points, max. number	–	5	–	5
Manual temperature input	×	×	×	×
Inputs for pH combination electrodes and ISE	BNC	BNC	2 BNC	2 BNC
Input for conductivity measuring cells	–	DIN	–	DIN
Date and time, non-volatile memory	×	×	×	×
Memory for measurement data	620	620	620	620
Dimensions in mm	265 × 200 × 100			

* Specifications based on a cell constant of 2.54 cm

pH│mV Meter – Reliability in All Applications

Basic Meter –
A strong basis featuring Sartorius quality
Four keys do it all!

The user-friendly prompts and messages guide you fast and reliably through laboratory routines.

PB–11

– Easy 1-key calibration of 1, 2 or 3 calibration points

– Automatic buffer recognition

– Automatic electrode test during calibration

– Automatic temperature compensation

– Clear readout with easy-to-understand symbols and LCD display

Three kits are available with different ranges of equipment:

Meter with electrode retainer arm, technical buffers, AC adapter and operating instructions, as well as:

– Refillable pH electrode, PY-P10, with plastic body and built-in temperature sensor PB-11-P10

– Refillable pH electrode, PY-P11, with glass body and built-in temperature sensor PB-11-P11

– Low-maintenance pH electrode, PY-P20, with gel electrolyte PB-11-P20

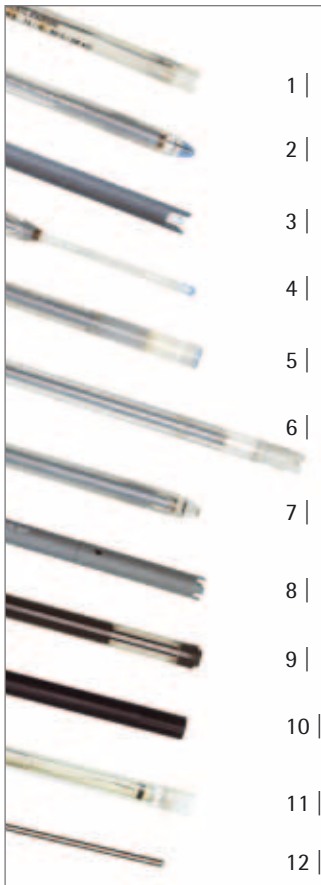**Portable Meter –**
Compact design – solid performance
It's easy to operate anywhere in the field where you need accurate measurements on the spot.

Portable Meter PT–15│PT–20

– BNC connector (pH, mV, ORP) and DIN connector (conductivity)

– 3 point calibration

– Automatic recognition of buffer sets or cell constants

– Automatic temperature compensation and electrode testing

– Simultaneously displays the measured value and temperature

– Easy to toggle between the measurement modes

– Well protected against water splashes; waterproof rated to IP65

– High operating reliability during portable use thanks to battery indicating icon

Model	Measurement parameters	Electrode
PT-15	pH, mV, Temp ORP (redox potential)	–
PT-15P	pH, mV, Temp ORP (redox potential)	pH combination electrode Gel electrolyte Plastic body Temperature sensor
PT-20	Conductivity, Temp Salinity, TDS	–
PT-20C	Conductivity, Temp Salinity, TDS	2 Band Conductivity Cell K=1.0 cm^{-1} with built in ATC

Specifications

	Basic Meter PB–11
pH measurement	
Measuring range	–1.99 … 19.99
Calibration points, max. number	3
mV measurement	
Measuring range in mV	–1,800 … +1,800
Temperature measurement	
Measuring range in °C	–5 … +105
Input for pH combination electrodes	BNC
Protection class	–
Power supply	AC adapter
Dimensions in mm	230×120×80
Weight	1,390 g

Sensors for the Highest Measuring Quality

1 |

2 |

3 |

4 |

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9 |

10 |

11 |

12 |

pH│ ATC combination electrodes – glass membrane electrodes

All pH combination electrodes have an Ag │ AgCl reference. The electrodes are supplied with a fixed cable and BNC connector; electrodes with a built-in temperature sensor additionally have a 2.5 mm male jack. All models are optionally available with DocuClip.

Figure	Order number	Construction	Built-in temperature sensor	Application range pH value	Application
1	PY-P10	Plastic body; electrolyte: KCl 3 mol/l, free of silver ions, fiber junction	yes	0 … 14	Simple standard applications
2	PY-P11	Glass body; electrolyte: KCl 3 mol/l, free of silver ions, platinum junction, toughened, low-resistance glass	yes	0 … 14	All standard applications are TRIS-compatible
3	PY-P12	Plastic body, gel-filled, fiber junction	yes	0 … 14	Simple standard applications
3	PY-P20	Plastic body, gel-filled, fiber junction	no	0 … 14	Simple standard applications
2	PY-P21	Glass body; electrolyte: KCl 3 mol/l, free of silver ions, platinum junction, toughened, low-resistance glass	no	0 … 14	All standard applications are TRIS-compatible
4	PY-P22	Microelectrode (length 110 mm, diameter 5 mm), electrolyte: KCl 3 mol/l, free of silver ions, platinum junction, low-resistance glass	no	0 … 14	Low sample quantity
5	PY-P23	Flat-membrane electrode, glass body, gel-filled, annular gap junction, low-resistance glass	no	2 … 13	Surface measurements, low sample quantity
6	PY-P24	High-performance electrode, plastic body; electrolyte: KCl 3 mol/l, free of silver ions, adjustable sleeve junction for control of the flow rate of the KCl solution, low-resistance glass membrane	no	0 … 14	Samples with a low ionic concentration, emulsions, suspensions for extreme pH values

ORP combination (redox) electrodes

This type of electrode has an Ag │ AgCl reference. It is supplied with a permanently attached cable and a BNC connector.

Figure	Order number	Construction	Built-in temperature sensor	Application range pH value
7	PY-R01	Glass body, porous ceramic junction; probe: Platinum disc (4 mm diameter), electrolyte: KCl 3 mol/l, free of silver ions	no	0 … 14

Conductivity cells and multisensor cell (pH, conductivity, temperature)
The conductivity cells are supplied with a permanently attached cable and an 8-pin DIN connector.

Figure	Order number	Recommended measuring range	Construction	Application range pH value
8	PY-R01	0.5 µS/cm ... 2,000 µS/cm	4-band conductivity cell (platinum)	yes
8	PY-C02	0.01 mS/cm ... 5 mS/cm	4-band conductivity cell (platinum)	yes
8	PY-C03	1 mS/cm ... 200 mS/cm	4-band conductivity cell (platinum)	yes
	PY-C12	1 µS/cm ... 300,000 µS/cm	4-band conductivity cell (graphite)	yes
3	PY-PC1	0.01 mS/cm ... 5 mS/cm pH value 0 ... 14	Combination electrode, 12 mm diameter; 120 mm length; 2-band cell (platinum); pH electrode with gel-filled electrode; temperature sensor	yes

Ion-selective pH combination electrodes
All ion-selective electrodes are combination electrodes. They are supplied with a permanently attached cable and a BNC connector.

Figure	Order number	Ion	Measuring range in ppm	pH application range
9	PY-I01	Fluoride (F^-)	0.05 ... 500	5 ... 5.5
10	PY-I02	Ammonia (NH_3)	0.02 ... 17,000	$\geq$ 11
11	PY-I03	Sodium (Na^+)	0.02 ... to saturated solution	9 ... 12
9	PY-I04	Chloride (Cl^-)	2 ... 35,500	2 ... 12
9	PY-I05	Nitrate (NO_3^-)	0.4 ... 62,000	2.5 ... 11
9	PY-I06	Potassium (K^+)	0.04 ... 39,000	2 ... 12
9	PY-I07	Calcium (Ca^{2+})	0.2 ... 40,000	2.5 ... 11
9	PY-I08	Silver|sulfide (Ag^+|S^{2-})	0.003 ... 12,000 S^{2-}| 0.01 ... 108,000 Ag^+	>12 S^{2-}| 2 ... 8 Ag^+

Temperature compensating probe
NTC 10 kΩ Stainless-steel sensor with permanently attached cable and a 2.5 mm male jack.

Figure	Order number	Recommended for...	Construction
12	PY-T01	Temperature measurement and automatic temperature compensation – 120 mm length without built-in temperature sensor	Stainless-steel body, 4.7 mm diameter,

Accessories

	Order number
Data Printer for Professional Meter and Docu-pH$_{Meter}$ Docu-pH+$_{Meter}$	YDP20-PH
Paper rolls, 5 x 40 m rolls	6906937
Ink ribbon	6906918

pH buffers

50 capsules per pack; dissolve contents of each capsule in 100 ml of distilled water	
pH = 4.01 ±0.02 at 25°C	PY-Y01
pH = 7.00 ±0.02 at 25°C	PY-Y02
pH = 9.00 ±0.02 at 25°C	PY-Y03
pH = 10.00 ±0.02 at 25°C	PY-Y04
Color-coded buffer solution in practical pump-bottle, eliminates the need for a beaker during calibration, traceable to NIST standards	
pH = 4.00 ±0.01 at 25°C, 500 ml	PY-Y21
pH = 4.00 ±0.01 at 25°C, 6×90 ml	PY-Y21-6
pH = 7.00 ±0.01 at 25°C, 500 ml	PY-Y22
pH = 7.00 ±0.01 at 25°C, 6×90 ml	PY-Y22-6
pH = 10.00 ±0.01 at 25°C, 500 ml	PY-Y23
Storage solution, for pH combination electrodes, 500 ml	PY-Y05
Cleaning solution, pepsin │ hydrochloric acid, 500 ml	PY-Y06
Electrolyte solution, KCl (3 mol/l), free of silver ions, 500 ml	PY-Y07

Conductivity standards, traceable to NIST standards

0.084 mS/cm ±1.0 % at 25°C (KCl 0.0001 mol/l), 500 ml	PY-Y10
0.147 mS/cm ±1.0 % at 25°C (KCl 0.001 mol/l), 500 ml	PY-Y11
1.413 mS/cm ±1.0 % at 25°C (KCl 0.01 mol/l), 500 ml	PY-Y12
12.88 mS/cm ±1.0 % at 25°C (KCl 0.1 mol/l), 500 ml	PY-Y13

Equipment Qualification – IQ│OQ│PQ

Qualification (IQ│OQ) pH meter	8407pH
For each additional parameter	8407Para

Process
Weighing & Control

Process Weighing & Control: Reliable Weighing Equipment Based on Experience

Within our Process Weighing & Control business area, we offer an especially wide range of products and services for many industrial branches and applications.

Our solutions for your process
Our strength lies in the process industries, from the food industry through the chemical industry to pharma|cosmetics| life sciences. For regulated industries, we offer qualified performance, from products through application safety to service. Even for fields of application that have areas with explosion risks, our systems offer the highest level of safety (inc. international certifications).

In materials flow from goods acceptance and warehousing through production and quality assurance to outgoing goods: our systems record, control and check the materials flow and accompany the data flow. Sartorius systems ensure the optimal use of materials and the best yields.

In item-oriented manufacturing industries, we are present with counting scales and checkweighers.
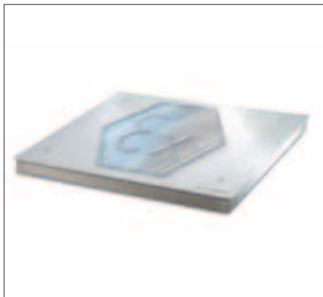
The typical requirements and conditions in each industrial sector are met thanks to the appropriate design of our equipment (process accuracy, materials selection, surface characteristics, device protection class, use in explosion risk areas, portable| fixed) and the accompanying qualification (IQ|OQ qualification documentation). Our solutions therefore support the requirements of current standards and regulations, such as ISO, DKD, USP, IFS, BRC, HACCP, GMP, EHEDG, GAMP, and ATEX.

Our solutions for your process
We see ourselves as specialists and highly capable partners for optimizing weight-based and lot-based processes. At Sartorius, we offer more than just products. We provide technical consulting services and problem-solving expertise that focus on your processes and add value.

Process optimization is one of the key driving forces of innovation at Sartorius, as well as a driving force for your investment decision.

The high quality of our products and our prompt, worldwide service guarantee the optimal and efficient structuring of overall operating costs – another cornerstone of your investment decision.

Technical consulting is our calling
Although production processes may resemble each other, no one installation is ever the same as the other. This is why we offer our customers individual consulting to develop solutions that are precisely customized to their specific application.

We operate across the globe - contact us today!

Weigh, Detect, Control –
Reliable Technology for Your Process

Weigh

– Complete scales combine ease of use with high performance – comprehensive accessories and options permit perfect adaptation to the installation location and application

– Platforms in different materials and accuracies as the basis of a wide variety of industrial weighing tasks

– Weighing indicators and terminals permit individual process solutions, while a wide variety of interfaces and option cards permit connection to other systems

– Beltweighers for mass flow rate determination of granulated products and discharge regulation in various different designs for all installation locations.

– Paint mixing scales, from simple scales to complex, networked systems, with outstanding product features such as the recalculation function.

Detect

– Metal detectors for all types of packaged and unpackaged products and product flows

– X-ray inspection systems to detect metal, bone, glass, stones, ceramics and plastics. They are also used to recognize shape, volume and dimensions, fill level monitoring, completeness checking, weight checking, and the detection of cavities and rips in products.

– Online moisture measurement procedures permit the split-second determination of the moisture content in a running production process, with the use of microwave resonance and NIR technology.

Control

– Systems for precise dosing of individual components, with intelligent tracking of switch-off points for fast and precise filling.

– Recipe management systems for direct and simple management of recipe and material data: from single-user manual recipe systems through to fully automatic process control.

– Process controller with built-in PLC and built-in material and recipe database; ideal for dosing and recipe processes.

– Dynamic checkweighers for seamless weight control of loose or packaged products.

– Finished packaging control systems as a compact solution through to networked solutions for in-process quality assurance

– Weighing cells, installation kits and electronics – components optimally matched to each other cover the entire spectrum of hopper weighing applications.

– Process transmitters for tank, container and hopper scales combine particularly high accuracy and resolution with extremely high reliability

Service

Mechatronics Services
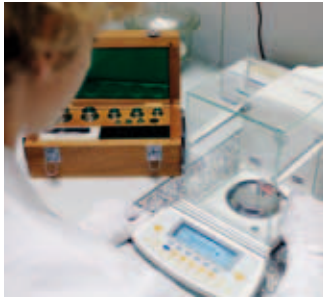
At your request, our service engineers will be involved early in the planning stage of your project, inputting their valuable practical experience right from square one. This procedure has many advantages provided by optimized scheduling and minimal downtimes during startup, maintenance, repairs and equipment deinstallation.

Our service portfolio covers extensive options, such as contracts for calibration, maintenance, training courses and servicing with guaranteed response times – just to mention a few of the many services we offer.

Preventive maintenance, for example, considerably enhances the performance and product life of your system; this allows problems to be identified at an early stage or – ideally – prevents them from happening at all. This way, we safeguard your investment and help you optimize your overall costs.

We support you with these services:
– Installation and startup
– Supply of spare parts and consumables
– Equipment qualification (IQ | OQ | PQ)
– Maintenance services, training and
  service contracts
– Certificates and calibration services
– Repairs and corrective maintenance

Sales and Service Contacts

For further contacts, visit www.sartorius-mechatronics.com

Europe

Germany
Sartorius AG
Weender Landstrasse 94–108
37075 Goettingen

Phone +49.551.308.0
Fax +49.551.308.3289

info.mechatronics@sartorius.com
www.sartorius-mechatronics.com

Sartorius Mechatronics
C&D GmbH & Co. KG.
Am Gut Wolf 11
52070 Aachen

Phone +49.241.1827.0
Fax +49.241.1827.213

Sartorius Mechatronics T&H GmbH
Meiendorfer Strasse 205
22145 Hamburg

Phone +49.40.67960.303
Fax +49.40.67960.383

France & Suisse Romande
Sartorius Mechatronics
France SAS
4, rue Emile Baudot
91127 Palaiseau Cedex

Phone +33 (0) 1 69 19 21 00
Fax +33 (0) 1 69 20 09 22

service.client@sartorius.com
www.sartorius-mechatronics.fr

Belgium
Sartorius Mechatronics
Belgium N.V.
Leuvensesteenweg, 248/B
1800 Vilvoorde

Phone +32.2.756.06.71
Fax +32.2.253.45.95

info.belgium@sartorius.com
www.sartorius.be

Hungary
Sartorius Mechatronics Hungária Kft.
Kagyló u. 5.
2092 Budakeszi

Phone +3623.457.227, 457.228, 457.148
Fax +3623.457.147

mechatronika@sartorius.hu
www.sartorius-mechatronics.com

Ireland
Sartorius Mechatronics UK Limited
Unit 41, The Business Centre
Stadium Business Park
Ballycoolin Road
Dublin 11

Phone +353-(0)1-8089050
Fax +353-(0)1-8089388

info.ireland@sartorius.com
www.sartorius-mechatronics.ie

Italy
Sartorius Mechatronics Italy S.r.l.
Uffici di Milano
Viale A. Casati, 4
20053 Muggiò (Milan)

Phone +39.039.46591
Fax +39.039.465988

info@sartorius.it
www.sartorius-mechatronics.it

Netherlands
Sartorius Mechatronics
Netherlands B.V.
Edisonbaan 24
3439 MN Nieuwegein

Phone +31.30.6053001
Fax +31.30.6052917

weegtechniek.nl@sartorius.com

Poland
Sartorius Mechatronics
Poland Sp. z o.o.
ul. Wrzesinska 70
62-025 Kostrzyn

Phone +48.61.6473830
Fax +48.61.6473839

info.pl@sartorius.com
www.sartorius-mechatronics.pl

Spain
Sartorius Mechatronics Spain S.A.U.
Offices in Madrid:
c/ Isabel Colbrand, 10–12, of. 70
28050 Madrid

Phone +34.91.358.60.94
Fax +34.91.358.84.85

Sartorius Mechatronics Spain S.A.U.
Offices in Barcelona:
C/Marcus Porcius, 1 (Edificio BCIN)
Polígon Les Guixeres s/n
08915 - Badalona
Barcelona – Spain

Phone +34.902.123.367
Fax +34.91.358.96.23

spain.weighing@sartorius.com
www.sartorius-mechatronics.es

Switzerland
Sartorius Mechatronics Switzerland AG
Ringstrasse 24a
8317 Tagelswangen (ZH)

Phone +41.44.746.50.00
Fax +41.44.746.50.50

mechatronics.switzerland@
sartorius.com

U.K.
Sartorius Mechatronics UK Ltd.
Longmead Business Centre
Blenheim Road, Epsom
Surrey. KT19 9QQ

Phone +44.1372.737102
Fax +44.1372.729927

uk.customerservice@sartorius.com
www.sartorius-mechatronics.co.uk

America

Argentina
Sartorius Argentina S.A.
Int. A. Ávalos 4251
B1605ECS Munro
Buenos Aires

Phone +54.11.4721.0505
Fax +54.11.4762.2333

sartorius@sartorius.com.ar

Brazil
Sartorius do Brasil Ltda.
Av. D. Pedro I, 241
Vila Pires – Santo André
São Paulo
09110-001

Phone +55.11.4451.6226
Fax +55.11.4451.4369

sartorius@sartorius.com.br

Canada
Sartorius Mechatronics Canada
2179 Dunwin Drive #4
Mississauga, ON L5L 1X2

Phone +1.905.569.7977
Toll-Free +1.800.668.4234
Fax +1.905.569.7021

sales.canada@sartorius.com

Mexico
Sartorius de México S.A. de C.V.
Circuito Circunvalación Poniente
No. 149
53100, Satélite Estado de México,
México

Phone +5255.5562.1102
Fax +5255.5562.2942

sartorius@sartomex.com.mx

USA
Sartorius Mechatronics
Corporation
5 Orville Drive
Bohemia, NY 11716

Phone +1.631.254.4249
Toll-free +1.800.635.2906
Fax +1.631.254.4253

wt.sales@sartorius.com

Asia | Pacific

China
Sartorius Scientific
Instruments (Beijing) Co., Ltd.
Konggang Industrial Zone B
No. 33 Yu'an Road
101300 Beijing, Shunyi District

Phone +86.10.8042.6300
Fax +86.10.8042.6486

ssil@sartorius.com
www.sartorius.com.cn

Hong Kong
Sartorius Mechatronics
Hong Kong Ltd.
Unit 1012, Lu Plaza
2 Wing Yip Street
Kwung Tong
Kowloon, Hong Kong

Phone +852.2774.2678
Fax +852.2766.3526

enquiry.hongkong@sartorius.com
www.sartorius-mechatronics.com.hk

India
Sartorius Mechatronics India Pvt Ltd.
69/2 & 69/3, Jakkasandra,
Kunigal Road, Nelamangala Tq
Bangalore-562 123

Phone +91.80.4350.5250/51/52

mechatronics-india@sartorius.com

Indonesia
PT. Sartorius Mechatronics Indonesia
Prisma Kedoya Plaza Blok C no. 5
Jl. Raya Pejuangan – Kebon Jeruk,
Jakarta Barat 11530, Indonesia

Phone: +62.21 5365.1248
Fax: +62.21 5365.1246

enquiry.indonesia@sartorius.com
www.sartorius-mechatronics.co.id

Japan
Sartorius Mechatronics Japan K.K.
8-11, Kita-Shinagawa 1-chome
Shinagawa-ku
Tokyo 140-0001

Phone +81.3.3740.5408
Fax +81.3.3740.5406

info@sartorius.co.jp
www.sartorius.co.jp

Philippines
Sartorius Mechatronics Philippines,
Incorporated
Unit 20-A The World Centre Building
330 Senator Gil Puyat Avenue Makati
City Philippines 1209

Phone +632.8640929
Fax +632.8640932

enquiry.philippines@sartorius.com
www.sartorius-mechatronics.com.ph

Singapore
Sartorius Mechatronics
Singapore Pte. Ltd.
10 Science Park Road
#02-25, The Alpha
Singapore Science Park II
Singapore 117684

Phone +65.6872.3966
Fax +65.6778.2494

enquiry.singapore@sartorius.com

South Korea
Sartorius Mechatronics
Korea Ltd.
Yangjae B/D 4, 5F
209-3, Yangjae-Dong, Seocho-Ku
137-893 Seoul, Korea

Phone +82.2.575.6945
Fax +82.2.575.6949

enquiry.korea@sartorius.com
www.sartorius.co.kr

Thailand
Sartorius Mechatronics
Thailand Co. Ltd.
No. 129 Rama IX Road
Huaykwang
Bangkok 10310

Phone +66 2643.8361
Fax +66 2643.8367

enquiry.thailand@sartorius.com
www.sartorius-mechatronics.co.th

Australia
Sartorius Mechatronics
Australia Pty Ltd.
Unit 5, 7-11 Rodeo Drive
Dandenong South Vic 3175

Phone +61.3.8762.1800
Fax +61.3.8762.1828

Info.Australia@Sartorius-Stedim.com